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OFFICE OF STRATEGIC SERVICES

RESEARCH AND ANALYSIS BRANCH

In collaboration with the

FOREIGN ECONOMIC ADMINISTRATION

Enemy Areas Branch

R & A No. 1000

JAPAN'S ELECTRIC POWER INDUSTRY

VOLUME II

15 November 1943

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JAPAN'S ELECTRIC POWER INDUSTRY

VOLUME II

15 November 1943

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ERRATA

Page	Plant and Heading	Erratum
35	Chita Factory Steam Plant - Location	"Toya Spinning Mill" should read "Toyo Spinning Mill"
42	Doi Hydro Plant - Location: Dam	"Yamagata-ken" should read "Yamagata-gun"
43	Doigawa Hydro Plant - Source of Power	"Niyoda-gawa" should read "Niyodo-gawa"
49	Ezu Factory Steam Plant - Plant name	Plant name should read "Gotsu Factory Steam Plant"
49	Ezu Factory Steam Plant - Location	Location should read "Gotsu-machi, Naka-gun, Shimane-ken"
49	Ezu Factory Steam Plant - Importance	Rankings should read "Rank in Japan - 225; rank in Chugoku supply area - 19"
82	Higashihama Steam Plant - Details: Turbines	"Stahl-make" should read "STAL-make"
83	Higashi Kadohara Hydro Plant - Location	"Katsubara-oaza" should read "Kadohara-oaza"

The following photographs have been added:

Photograph No.	Subject	Follows Page	OSS Accession No.
II-31a	Fuseda Hydro Plant	62	96297
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II-68a	Inawashiro No. 4 Hydro Plant	121	96299

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INTRODUCTION

The pages which follow constitute Volume II of the five volumes included in Japan's Electric Power Industry, a report by the Office of Strategic Services in collaboration with the Foreign Economic Administration.

Volume I is devoted to the general analysis of the electric power industry in Japan, in respect to the essentials of production, distribution, and consumption; and as regards the importance of electric energy in the operation of Japan's national economy. This general analysis volume also includes a list of important transmission lines and transformer substations.

Volumes II, III, IV, and V consist of the enumeration and description of Japanese generating plants, in alphabetical order. Volume II lists the first two hundred and fifty plants.

The area covered by these volumes is confined to Japan Proper, i.e., to the 47 prefectures and Hokkaido. It encompasses the four main islands, as well as the Nansei Shoto, the Nanpo Shoto, and the numerous islands and islets nearby — extending approximately from 25° to 45° N. Lat. The electric installations described have been confined to plants having a capacity of 1000 kilowatts or more. The plants listed in the entire report are estimated to embrace more than 90 percent of the generating capacity of the area, as of 1 January 1943.

The information throughout is as complete and recent as can be secured at the present time. Owing to the fact that, since 1937 or even earlier, the Japanese have been secretive and noncommittal about their electric power developments, reference to individual plants has been sporadic and scanty in English and other European languages. For this reason all possible use has been made of technical and engineering periodicals printed in Japanese, and these furnished by far the greater part of the data to be found in Volumes II, III, IV, and V.

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The Japanese technical journals which proved particularly prolific as sources of information to the compilers were the following: Denki Gakkai Zasshi (Journal of the Society of Electrical Engineers); Doboku Gakkai-shi (Journal of the Society of Civil Engineers); Ohm (a semi-popular journal of electrical engineering); Shibaura Review (the house organ of the Tokyo Shibaura Engineering Works); Hitachi Hyoron (the house organ of the Hitachi Engineering Works); and the Denki Jigyo Yoran (Survey of Electrical Enterprises, published by the Electric Bureau of the Japanese Department of Communications).

The question has sometimes been raised whether these Japanese periodicals have published the authentic facts or have tried, deliberately, to mislead both the Japanese readers and readers outside of Japan. This question cannot be answered with finality at present. However, the compilers of the present work believe it extremely unlikely that such a conspiracy of misrepresentation has actually been practiced by the Japanese technical journals. On the contrary, the material discovered in these technical journals has in many instances been substantiated by first-hand accounts of American and British engineers who have sold equipment or made installations in Japan. On the whole the Japanese journals are probably as accurate as comparable American and British journals dealing with electric power.

If information regarding Japan's electric developments was generally difficult to secure between 1937 and the outbreak of hostilities in December 1941, these difficulties have multiplied since that date. Consequently, the information embodied in the present work does not as a rule extend beyond 1941.

In general, and particularly in the last decade, electric power in Japan has been a rapidly expanding and not a fixed industry. Therefore, it would be impossible to vouch that the data on every single plant among

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the thousand or more included in the volume are strictly up-to-date. Moreover, in the past two years some noteworthy expansion in generating capacity has undoubtedly been achieved. But this progress, owing to the slowness with which, at best, new plants are built or new generating equipment installed, cannot have been so exceptional as to alter radically the great bulk of data supplied in the present report.

In addition to the collaboration of the Enemy Areas Branch of the Foreign Economic Administration, assistance and cooperation were received from the Target Information Branch of the Office of the Assistant Chief of Air Staff, Intelligence; the Chief of the Far Eastern Unit, Military Intelligence Service and other sections of G-2; the Intelligence Branch of the Office of the Chief of Engineers; the Federal Power Commission; the Anti-trust Division of the Department of Justice; and the Securities Exchange Commission.

By [illegible] NARA. Date [illegible]

EXPLANATORY NOTES

In the Listing of Power Plants the data has been arranged under the following major headings:

PLANT NAME

Company

Location

Capacity (Installed Capacity, or Capacity Commonly in Use)

Importance

Source of Power

Date of Construction

Details

See

Sources

In order to economize in space, numerous abbreviations have been used and much explanatory material has been omitted from the listing. Abbreviations follow in a separate section. The explanatory material is given below according to the major headings.

Plant Name

The nature of the motive power has been indicated by the plant title. Except where specifically noted, it is understood that steam plants use coal as fuel. Cross references have been used wherever a plant is known by different names or where variant readings of the Japanese characters are possible.

Coordinates

These coordinates have been derived from Dai Nippon Teikoku Rikuchi Sokuryo-bu, Nijuman-bun-ichi Teikoku-zu (Great Japan Imperial Land Survey Bureau, Maps of the Japanese Empire, Scale 1:200,000). While listed as approximate they are believed to be generally accurate to within 1'. In many cases they are accurate to within 30".

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Company

The most recent known owner of the plant has been given, usually as of March 1940. Where previous owners are known, they have been listed for convenience in identification, but no pretense has been made to a complete listing of all owners in the history of the plant. "KK" is an abbreviation for Kabushiki Kaisha, roughly translated as "corporation." A list of transliterated names of Japanese electric light and power companies and the English equivalents appears separately.

Location

Japanese addresses have been used because the information as received was in this form and because any detailed map work must deal with these jurisdictional areas. Additional information has been given where known. The translation of the Japanese jurisdictional terms arranged alphabetically follows:

aza - subdivision of oaza, or a less populous subdivision of mura or machi
banchi - street number
cho - precinct, subdivision of ku
chome - subdivision of machi or cho
fu - urban prefecture (3 in Japan)
gun - county, subdivision of fu or ken
ken - rural prefecture (44 in Japan)
ku - ward, subdivision of shi
machi - 1) in rural areas a town, subdivision of gun
2) in urban areas, same as cho
mura - a township, subdivision of gun
oaza - subdivision of mura, machi, or shi
shi - city, subdivision of a prefecture

These terms follow the proper name and are separated from it by a hyphen, as Kanagawa-ken, Yawata-shi. All names down to and including mura and machi have been checked with the Teikoku Shichoson Soran (July 1940) and the readings are considered generally accurate.

Capacity

In the United States only three terms are used to define generating capacity — installed, dependable, and net assured. In Japan there is a multiplicity of terms. In the case of steam plants, the most significant

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capacity listed is "installed," that is, name-plate capacity. Where equipment was known in only kilovolt-amperes, conversion to kilowatts has been made by assuming an 80 percent power factor, and this estimated figure has been preceded by an asterisk. In the case of hydro plants, "capacity commonly in use" has been given as the most significant capacity. Such capacity is in use six or nine months in the year, and is the sum of "regular" and "special" capacities.

Japanese definitions of various capacities may be explained somewhat as follows:

Hydro plants. After a study of average stream flow and average rainfall in a region over a period of years, that stream flow which is available on all but the driest ten days of the year determines the minimum generating capacity that can be depended upon, and is called "regular" capacity. (The American equivalent is "dependable" capacity.) The peak capacity at this time is called "regular peak." That stream flow which is available for six or nine months determines the maximum capacity that can be depended on for continuous (though not necessarily consecutive) operation, and it is called "maximum" capacity or, in this report, "capacity commonly in use." The peak capacity during these months is called "maximum peak." The difference between "maximum" and "regular" capacities is called "special" capacity.

Steam plants. The minimum continuous capacity that is actually in use is called "regular" capacity, while the greatest continuous capacity actually in use is called "maximum" capacity.

"Reserve" capacity in steam plants, like the American equivalent, is used for reserves, in the event of contingencies, or peak loads, or when part of the equipment is taken out for repair.

"Supplementary" capacity in steam plants is that capacity which is used in dry season to offset the decline in power generation by hydro plants.

Importance

Under this heading "rank in Japan" and "rank in supply area" have

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been given. Rank has been determined by installed capacity in the case of steam plants and capacity commonly in use in the case of hydro plants. Ranking has been extended to 250 for Japan as a whole. In each of the seven supply areas, ranking has been extended to the more important plants, as follows: Tokyo - 100, Osaka-Nagoya - 100, Kyushu - 50, Chugoku - 25, Tohoku - 20, Shikoku - 15, Hokkaido - 15.

Supply areas have been determined on the basis of location of the plant and frequency at which power is generated. In the case of a plant with two frequencies and two network tie-ups, the rank in each supply area has been given.

Where no definite evidence exists that plants would be completed by January 1943 or shortly thereafter, they have been left unranked.

Direct tie-ups with specific factories or mines have been indicated where shown.

Source of power

Whenever possible, names of the rivers at the intakes, tributary bodies of water, and the river system have been given. The Japanese words used in this connection have the following English meanings:

dani	valley
gawa	river
kai	sea
kawa	river
ko	lake
nada	sea
san	mountain
sawa	marsh
take	peak
taki	waterfall
tani	valley
wan	bay
yama	mountain
zawa	marsh

When these terms denote a geographical meaning they follow the proper name and are separated from it by a hyphen, as Kiso-gawa, Tazawa-ko. Where no hyphen appears it indicates that they are an integral part of the proper name and may or may not have geographical significance, as Kanagawa, Sawado.

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Whenever possible, geographical names have been checked with Yoshida, Togo, Dai Nippon Chimei Jisho. However, many of the streams are small and do not appear in any available directory of Japanese proper names. Consequently, occasional doubtful readings may be encountered.

Date of construction

When known, the following dates have been stated under this heading: when construction was begun, when it was completed, when new equipment was installed, and when the plant was last known to be in operation. In the case of plants "under construction," the compilers have indicated their best judgment as to whether a plant in question has been completed.

Details

All significant detail has been stated when available. Physical descriptions of plants and surroundings have been limited to salient features from the viewpoint of recognizability and vulnerability to attack. Much of the equipment listed is as of 1929 and it is possible that new equipment in some instances has been installed, with the same or larger capacity and with greater technical efficiency. Particularly is this true in the case of transformers, where recent construction of super high-tension transmission lines may have necessitated new transformer equipment.

Technical abbreviations used appear in the section on Abbreviations which follows.

See

This heading refers to photographs and maps relating to the plant under discussion which have been included in this or other volumes of the report. Only photographs which would aid in recognizability and determining vulnerability to attack have been used.

Sources

The sources from which the large mass of data presented in this volume were obtained may be found in the list of source abbreviations in the section which follows.

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ABBREVIATIONS

Technical terms

a	amperes
ac	alternating current
adv	advertisement
ave	average
Btu	British thermal unit
C	centigrade
cap	capacity
cont	continuous
cm	centimeter
cm^2	square centimeter
cyc	cycles
dc	direct current
D-D	delta-delta (transformer connection)
D-Y	delta-Y (transformer connection)
econ	economical
eff	effective
est	estimated
F	Fahrenheit
ft	feet
ft^2	square feet
hp	horsepower
in	inch
in^2	square inch
kg	kilogram
kg/cm^2	kilograms per square centimeter
km	kilometer
kv	kilovolt
kva	kilovolt-ampere
kw	kilowatt
kwh	kilowatt-hour
lb	pound
lbs/in^2	pounds per square inch
m	meter
m^2	square meter
m^3	cubic meter
m^3/sec	cubic meters per second
max	maximum
max pk	maximum peak
min	minute
mini	minimum
no	number
opp	opposite
pf	power factor
ph	phase
qv	which see
reg	regular capacity
reg pk	regular peak
res	reserve, reserve capacity
rpm	revolutions per minute
sec	second
spec	special capacity
supp	supplement, supplementary capacity
t	ton
t/hr	tons per hour
v	volt
Y-Y	transformer connection
@	each
*	indicates that kw have been estimated from kva at 80 percent power factor

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Non-Japanese trade names

AC	Allis-Chalmers Mfg. Co.
AEG	Allegemeine Elektricitäts-Gesellschaft
ASEA	Allmänna Svenska Elektriska Aktiebolag
B	Boving & Co., Ltd.
BBC	Brown, Boveri & Co., Ltd.
BTH	British Thomson-Houston Co., Ltd.
B & W	Babcock & Wilcox Co.
D	Dicker
EC	Erie City Boiler Co.
EE	English Electric Co., Ltd.
EW	Escher, Wyss Co.
G	Green Economizer Co.
GE	General Electric Co.
H	Heine
IPM	I. P. Morris Co.
MV	Metropolitan-Vickers Electrical Co., Ltd.
P	Pelton Steel Casting Co.
R	Russell
S	Shepardson
SB	Sulzer Brothers, Ltd.
SS	Siemens Schukert Werke A. G.
STAL	Svenska Turbin fabriks Aktiebolaget Ljungström
V	Voith
W	Westinghouse Electric & Mfg. Co.
WE	Western Electric Co.

Sources

AA	All Asano, an album of photographs published by the Asano Cement Co., date unknown but sometime after 1936
D	Doryoku, Nippon Doryoku Kyokai Kaiho (Power, Journal of the Japan Power Association), monthly, 1938-1940
DGS	Doboku Gakkai-shi (Journal of the Society of Civil Engineers), monthly, 1930-1940
DGS Kaimu	Doboku Gakkai Kaimu (Proceedings of the Society of Civil Engineers), monthly, 1930-1940
DHJ	Dai Hyakka Jiten (Encyclopedia), 28 vols., Tokyo, Heibonsha, 1935
DJY	Denki Jigyo Yoran (Survey of Electrical Enterprises), published annually by the Electric Bureau of the Department of Communications, 1927, 1929
DKSS	Doboku Koji Shashin-shu (Collection of Photographs of Civil Engineering Works), published by the Society of Civil Engineers of Japan, 1930
DnGZ	Denki Gakkai Zasshi (Journal of the Society of Electrical Engineers), monthly, 1927-1941
DnK	Denryoku Konzern Tokuhon (Reader of Electric Power Trusts), 1937
DnN	Denki Nenkan (Electrical Yearbook), 1940
HH	Hitachi Hyoron (Hitachi Review), published monthly by the Hitachi Engineering Works, 1939-1941
HSG	Hatsuden Suiryoku-gaku (Study of Hydroelectric Power Generation), 1938
HY	Hitachi Yoran, Hitachi Products, a catalogue of products of the Hitachi Engineering Works, 1935

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KCD	Kampo (Government Gazette), Communications Department Ordinances, 1941
KDHJ	Kokumin Dai Hyakka Jiten (National Encyclopedia), 1936
KKZ	Kogyo Kagaku Zasshi (Journal of Industrial Chemistry), monthly, 1939-1941
KN	Kogyo Nenkan (Industrial Yearbook), annually, 1939, 1940
MD	Mitsubishi Denki (Mitsubishi Electrical Machinery), published monthly by the Mitsubishi Electrical Machinery Co., 1939-1941
NCFT	Nippon Chiri Fuzoku Taikei (Outline of Japanese Geography and Ethnography), 18 vols., 1930
NCT	Nippon Chiri Taikei (Outline of Japanese Geography), 12 vols., 1931
NKGS	Nippon Kikai Gakkai-shi (Journal of the Japanese Society of Mechanical Engineers), monthly, 1938
Ohm	Ohm (a semi-popular journal of electrical engineering), monthly, 1926-1941
Ohm-sha Guide	Zenkoku Dai Hatsudensho Ichiran (10,000 kva Ijo) Large Power Stations in Japan over 10,000 kva, published by The Ohm-sha, Ltd., 1928 and 1933 editions
SKT	Sumitomo Konzern Tokuhon (Reader of the Sumitomo Trust), 1937
SnJ	Sumitomo-no Jigyo (Sumitomo Enterprises), 1940
SND	Shin Nippon Daikan (Survey of New Japan), published by Osaka Mainichi Shimbun, 1937
SR	Shibaura Review (changed in 1941 to Shibaura Giho, meaning Shibaura Review), published monthly by the Tokyo Shibaura Engineering Works, 1927-1941
TD	Toho Electric Power Co., Ltd., 1926
TD Map	Map of Transmission lines appearing in Toho Electric Power Co., Ltd., 1928
TKS	Toyo Keizai Shimpo (The Oriental Economist), Japanese edition, weekly, 1939-1941
TDKK	Tokyo Dento Kabushiki Kaisha Gojunen-shi (Fifty-year History of the Tokyo Electric Light Company), 1936
TWPC	Third World Power Conference, Washington, 1936
ZKT	Zenkoku Kojo Tsuran (Roster of Japanese Factories), 1939 edition

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JAPANESE ELECTRIC LIGHT AND POWER COMPANIES

Agatsumagawa Denryoku KK	Agatsumagawa Electric Power Co.
Aiki Suiryoku Denki KK	Aiki Hydroelectric Power Co.
Aizu Denryoku KK	Aizu Electric Power Co.
Akita Suiryoku Denki KK	Akita Hydroelectric Power Co.
Aomori Dento KK	Aomori Electric Light Co.
Aomori-ken	Aomori Prefecture
Arakawa Denryoku KK	Arakawa Electric Power Co.
Asahi Bemberg Kenshi KK	Asahi Bemberg Silk Thread Co.
Asahi Kenshoku KK	Asahi Silk Weaving Co.
Asano Cement KK	Asano Cement Co.
Awaji Denki Tetsudo KK	Awaji Electric Railroad Co.
Azumi Denki KK	Azumi Electric Co.
Azusagawa Denryoku KK	Azusagawa Electric Power Co.
Chichibu Cement KK	Chichibu Cement Co.
Chikuma Denki KK	Chikuma Electric Co.
Chubu Denryoku KK	Chubu Electric Co.
Chubu Godo Denki KK	Chubu United Electric Co.
Chubu Kyodo Karyoku Hatsuden KK	Chubu Consolidated Steam Power Electric Generating Co.
Chuetsu Suiden KK	Chuetsu Hydroelectric Co.
Chugai Denryoku KK	Chugai Electric Power Co.
Chugoku Godo Denki KK	Chugoku United Electric Co.
Chuo Denki KK	Central Electric Co.
Chuo Denryoku KK	Central Electric Power Co.
Daido Denryoku KK	Great Consolidated Electric Power Co.
Dai Nippon Boseki KK	Great Japan Spinning Co.
Dai Nippon Denryoku KK	Great Japan Electric Power Co.
Daishojigawa Suiden KK	Daishojigawa Hydroelectric Co.
Deguchi Dehoka Nimei	Deguchi and Dehoka
Denki Kagaku Kogyo KK	Electro Chemical Industries Co.
Eai Suiden KK	Eai Hydroelectric Co.
Echigo Denryoku KK	Echigo Electric Power Co.
Echizen Denki KK	Echizen Electric Co.
Fuefuki Suiden KK	Fuefuki Hydroelectric Co.
Fuji Denryoku KK	Fuji Electric Power Co.
Fuji Gasu Boseki KK	Fuji Gas Spinning Co.
Fujikawa Denryoku KK	Fujikawa Electric Power Co.
Fuji Seishi KK	Fuji Paper Manufacturing Co.
Fuji Seni Kogyo KK	Fuji Fiber Industry Co.
Fukushima Dento KK	Fukushima Electric Light Co.
Fukushima Jinken KK	Fukushima Rayon Co.
Fukuyama Denki KK	Fukuyama Electric Co.
Furukawa Sekitan Kogyo KK	Furukawa Coal Mining Co.
Gifu Denryoku KK	Gifu Electric Power Co.
Godo Denki KK	United Electric Co.
Gumma Suiden KK	Gumma Hydroelectric Co.
Hachinoe Suiryoku Denki KK	Hachinoe Waterpower Electric Co.
Hakodate Suiden KK	Hakodate Hydroelectric Co.
Hakusan Suiryoku KK	Hakusan Waterpower Co.
Hanshin Denki Tetsudo KK	Osaka-Kobe Electric Railroad Co.
Hida Dento KK	Hida Electric Light Co.
Hietsu Denki KK	Hietsu Electric Co.
Higashi Tagawa-gun Denki Kumiai	Higashi Tagawa-gun Electric Association

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Hikuma Denryoku KK	Hikuma Electric Power Co.
Hirosaki Dento KK	Hirosaki Electric Light Co.
Hirosegawa Denryoku KK	Hirosegawa Electric Power Co.
Hiroshima Denki KK	Hiroshima Electric Co.
Hiroshima Gasu Denki KK	Hiroshima Gas and Electric Co.
Hitachi Denryoku KK	Hitachi Electric Power Co.
Hokkai Denki Kogyo KK	Hokkai Electric Industries Co.
Hokkai Suiryoku Denki KK	Hokkai Waterpower Electric Co.
Hokkaido Dento KK	Hokkaido Electric Light Co.
Hokkaido Suiryoku Denki KK	Hokkaido Waterpower Electric Co.
Hokkaido Tanko Kisen KK	Hokkaido Coal Mine & Steamship Co.
Hokuetsu Suiryoku Denki KK	Hokuetsu Waterpower Electric Co.
Horomankawa Suiryoku Denki KK	Horomankawa Waterpower Electric Co.
Hyogo-ken	Hyogo Prefecture
Hyuga Suiryoku Denki KK	Hyuga Waterpower Electric Power Co.
Ibigawa Denki KK	Ibigawa Electric Co.
Ibigawa Denki Kogyo KK	Ibigawa Electrical Industries Co.
Ichinoseki-machi Denki Sagyo-sho	Ichinoseki-machi Electrical Works
Imazu Hatsuden KK	Imazu Electric Generating Co.
Ina Denki Tetsudo KK	Ina Electric Railroad Co.
Inagawa Denryoku KK	Inagawa Electric Power Co.
Iriyama Saitan KK	Iriyama Coal Mining Co.
Ishikari Karyoku Hatsuden KK	Ishikari Steam Power Electric Generating Co.
Iwaki Tanko KK	Iwaki Coal Mining Co.
Iyo Tetsudo Denki KK	Iyo Railroad and Electric Co.
Izumo Denki KK	Izumo Electric Co.
Jintsu Denki Kogyo KK	Jintsu Electric Industries Co.
Jomo Denryoku KK	Jomo Electric Power Co.
Kagoshima-ken	Kagoshima Prefecture
Kagoshima Denki KK	Kagoshima Electric Co.
Kamioka Suiden KK	Kamioka Hydroelectric Co.
Kanagawa-ken	Kanagawa Prefecture
Kanazawa Denki KK	Kanazawa Electric Co.
Kanazawa Denki Kido KK	Kanazawa Electric Tramway Co.
Kanazawa-shi	Kanazawa City
Kanegafuchi Boseki KK	Kanegafuchi Spinning Co.
Kanogawa Denryoku KK	Kanogawa Electric Power Co.
Kansai Denryoku KK	Kansai Electric Power Co.
Kansai Kyodo Karyoku KK	Kansai Consolidated Steam Power Co.
Kanto Suiryoku KK	Kanto Waterpower Co.
Kashiwara Boseki KK	Kashiwara Spinning Co.
Katsuragawa Suiden KK	Katsuragawa Hydroelectric Co.
Keihan Denki Tetsudo KK	Kyoto-Osaka Electric Railroad Co.
Keihin Denryoku KK	Tokyo-Yokohama Electric Power Co.
Kidogawa Suiryoku Denki KK	Kidogawa Waterpower Electric Co.
Kinugawa Suiryoku Denki KK	Kinugawa Waterpower Electric Co.
Kiso Denki KK	Kiso Electric Co.
Kiso Denryoku KK	Kiso Electric Power Co.
Kiso Hatsuden KK	Kiso Electric Generating Co.
Kisogawa Denryoku KK	Kisogawa Electric Power Co.
Kobe-shi	Kobe City
Kochi-ken	Kochi Prefecture
Kofu Denryoku KK	Kofu Electric Power Co.
Koniya Suiryoku Denki KK	Koniya Waterpower Electric Co.
Koshu Denryoku KK	Koshu Electric Power Co.
Kotakegawa Denryoku KK	Kotakegawa Electric Power Co.
Kuhara Kogyo KK	Kuhara Mining Co.

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Kumagawa Denki KK	Kumagawa Electric Co.
Kumamoto Denki KK	Kumamoto Electric Co.
Kurobe Tetsudo KK	Kurobe Railroad Co.
Kurobegawa Denryoku KK	Kurobegawa Electric Power Co.
Kurozawashiri Denki KK	Kurozawashiri Electric Co.
Kyosai Denryoku KK	Kyosai Electric Power Co.
Kyoto Dento KK	Kyoto Electric Light Co.
Kyoto-shi	Kyoto City
Kyushu Denki KK	Kyushu Electric Co.
Kyushu Denki Kido KK	Kyushu Electric Tramway Co.
Kyushu Karyoku Hatsuden KK	Kyushu Steam Power Electric Generating Co.
Kyushu Kyodo Karyoku Hatsuden KK	Kyushu Consolidated Steam Power Electric Generating Co.
Kyushu Soden KK	Kyushu Electric Transmission Co.
Kyushu Suiryoku Denki KK	Kyushu Waterpower Electric Co.
Kyushu Tanko Kisen KK	Kyushu Coal Mine and Steamship Co.
Masuda Suiryoku Denki KK	Masuda Waterpower Electric Co.
Meiji Kogyo KK	Meiji Mining Co.
Mie Godo Denki KK	Mie United Electric Co.
Mikawa Suiryoku KK	Mikawa Waterpower Co.
Mima Suiryoku Denki KK	Mima Waterpower Electric Co.
Mitsubishi Kogyo KK	Mitsubishi Mining Co.
Mitsui Kogyo KK	Mitsui Mining Co.
Mitsui Kozan KK	Mitsui Mine Co.
Miyagi-ken	Miyagi Prefecture
Miyazaki-ken	Miyazaki Prefecture
Mizukubogawa Suiryoku Denki KK	Mizukubogawa Waterpower Electric Co.
Morioka Dento KK	Morioka Electric Light Co.
Morioka Denki Kogyo KK	Morioka Electrical Industries Co.
Murakami Suiden KK	Murakami Hydroelectric Co.
Muroran Dento KK	Muroran Electric Light Co.
Nagano Denki KK	Nagano Electric Co.
Nagano Dento KK	Nagano Electric Light Co.
Nankai Suiryoku Denki KK	Southern Sea Waterpower Electric Co.
Nankai Tetsudo KK	Southern Sea Railroad Co.
Nanshin Denki KK	Southern Shinano Electric Co.
Nihonmatsu Denki KK	Nihonmatsu Electric Co.
Niigata Denki KK	Niigata Electric Co.
Niigata Denryoku KK	Niigata Electric Power Co.
Niigata Suiryoku Denki KK	Niigata Waterpower Electric Co.
Ninkaho Denki Kumiai	Ninkaho Electric Union
Nippon Chisso Hiryo KK	Japan Nitrogen Fertilizer Co.
Nippon Denki Kogyo KK	Japan Electric Industries Co.
Nippon Denki Kagaku Kogyo KK	Japan Electro-chemical Industries Co.
Nippon Denko KK	Japan Electric Development Co.
Nippon Denryoku KK	Japan Electric Power Co.
Nippon Hassoden KK	Japan Electric Generation and Transmission Co.
Nippon Jinken Pulp KK	Japan Rayon and Pulp Co.
Nippon-kai Denki KK	Japan Sea Electric Co.
Nippon Keikinzoku KK	Japan Light Metals Co.
Nippon Kogyo KK	Japan Industrial Co.
Nippon Rayon KK	Japan Rayon Co.
Nippon Seitetsu KK	Japan Iron and Steel Manufacturing Co., Ltd.
Nippon Soda KK	Japan Soda Co.
Nippon Suiden KK	Japan Hydroelectric Co.
Nippon Takugyo KK	Japan Development Co.

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Nissei Rayon KK	Sino-Japanese Rayon Co.
Nobeoka Denki KK	Nobeoka Electric Co.
Nohi Denki KK	Mino-Hida Electric Co.
Oikawa Denryoku KK	Oikawa Electric Power Co.
Oji Seishi KK	Oji Paper Manufacturing Co.
Okayama Dento KK	Okayama Electric Light Co.
Okazaki Dento KK	Okazaki Electric Light Co.
Okinawa Denki KK	Okinawa Electric Co.
Ombata Suiryoku Denki KK	Ombata Waterpower Electric Co.
Omi Denryoku KK	Omi Electric Power Co.
Ominato Suiden KK	Ominato Hydroelectric Co.
Onoda Cement KK	Onoda Cement Co.
Osaka Denki Kido KK	Osaka Electric Tramway Co.
Osaka Denryoku KK	Osaka Electric Power Co.
Osaka Kozan Denki KK	Osaka Mine and Electric Co.
Osaka-shi	Osaka City
Osaka Soda KK	Osaka Soda Co.
Oshirogawa Denryoku KK	Oshirogawa Electric Power Co.
Otanigawa Denryoku KK	Otanigawa Electric Power Co.
Ou Dento KK	Ou Electric Light Co.
Oyodogawa Suiden KK	Oyodogawa Hydroelectric Co.
Rikuo Denryoku KK	Rikuo Electric Power Co.
Ryoha Denki KK	Ryoha Electric Co.
Sadamitsu Denryoku KK	Sadamitsu Electric Power Co.
Saikawa Denryoku KK	Saikawa Electric Power Co.
Sakata-shi	Sakata City
San-in Denki KK	San-in Electric Co.
Sanriku Suiden KK	Sanriku Hydroelectric Co.
Sanyo Chuo Suiden KK	Sanyo Central Hydroelectric Co.
Sanyo Suiryoku Denki KK	Sanyo Waterpower Electric Co.
Sapporo Soden KK	Sapporo Electric Transmission Co.
Sapporo Suiryoku Denki KK	Sapporo Waterpower Electric Co.
Seibu Kyodo Karyoku Hatsuden KK	Seibu Consolidated Steam Power Electric Generating Co.
Sekikawa Denryoku KK	Sekikawa Electric Power Co.
Sendai-shi	Sendai City
Sennan Denki Kogyo KK	Sennan Electric Industries Co.
Sento Tetsudo KK	Kawasaki-Tokyo Railroad Co.
Shikoku Chuo Denryoku KK	Shikoku Central Electric Power Co.
Shikoku Suiryoku Denki KK	Shikoku Waterpower Electric Co.
Shikumigawa Denryoku KK	Shikumigawa Electric Power Co.
Shimmi Denryoku KK	Shinano-Mino Electric Power Co.
Shinano Denki KK	Shinano Electric Co.
Shin-etsu Denryoku KK	Shinano, Echizen, Echigo and Etchu Electric Power Co.
Shin Nippon Rayon KK	New Japan Rayon Co.
Shinshu Denki KK	Shinshu Electric Co.
Shiohara Densha KK	Shiohara Tramcar Co.
Shizuoka Denryoku KK	Shizuoka Electric Power Co.
Shizuoka-shi	Shizuoka City
Shokawa Suiryoku Denki KK	Shokawa Waterpower Electric Co.
Showa Denki Kagaku Kogyo KK	Showa Electro-chemical Industries Co.
Showa Denryoku KK	Showa Electric Power Co.
Showa Jinken Rayon Co.	Showa Rayon Co.
Somu Denryoku KK	Sagami-Musashi Electric Power Co.
Suiyo Denki KK	Suiyo Electric Co.
Sumitomo Besshi Kozan KK	Sumitomo Besshi Mining Co.
Sumitomo, Kichizaemon	Kichizaemon Sumitomo (personal name)
Suwa Denki KK	Suwa Electric Co.
Suzuki Shoten KK	Suzuki Commercial Co.
Taihei Cement KK	Pacific Cement Co.
Taira Denryoku KK	Taira Electric Power Co.
Taiyo Rayon KK	Sun Rayon Co.

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Takaoka Dento KK	Takaoka Electric Light Co.
Takamatsu Dento KK	Takamatsu Electric Light Co.
Taki Seihi KK	Taki Artificial Fertilizer Co.
Tamagawa Suiryoku Denki KK	Tamagawa Hydroelectric Power Co.
Tateyama Suiryoku Denki KK	Tateyama Waterpower Electric Co.
Teikoku Denryoku KK	Imperial Electric Power Co.
Teikoku Dento KK	Imperial Electric Light Co.
Teikoku Jinzo Kenshi KK	Imperial Rayon Co.
Tekko-sha	Iron and Steel Co.
Tenryugawa Denryoku KK	Tenryugawa Electric Power Co.
Tenryu Denki KK	Tenryu Electric Co.
Tetorigawa Suiryoku Denki KK	Tetorigawa Waterpower Electric Co.
Tetsudo-sho	Department of Railways
Tobu Denryoku KK	Tobu Electric Power Co.
Toho Denryoku KK	Toho Electric Power Co.
Tohoku Cement KK	Northeastern Cement Co.
Tohoku Denryoku KK	Northeastern Electric Power Co.
Tohoku Dento KK	Northeastern Electric Light Co.
Tohoku Shinko Denryoku KK	Northeastern Development & Electric Power Co.
Tokai Shiryo KK	Tokai Paper Materials Co.
Tokuyama Soda KK	Tokuyama Soda Co.
Tokyo Denryoku KK	Tokyo Electric Power Co.
Tokyo Dento KK	Tokyo Electric Light Co.
Tokyo Hatsuden KK	Tokyo Electric Generating Co.
Tokyo Jinzo Kenshi KK	Tokyo Rayon Co.
Tokyo-wan Denki KK	Tokyo Bay Electric Co.
Tokyo-Yamate Kyuko Denki Tetsudo KK	Tokyo-Yamate Express Electric Railroad Co.
Toriumi Denryoku KK	Toriumi Electric Power Co.
Tosa Cement KK	Tosa Cement Co.
Tosa Denki KK	Tosa Electric Co.
Tosa Yoshinogawa Suiryoku Denki KK	Tosa Yoshinogawa Waterpower Electric Co.
Toshin Denki KK	Toshin Electric Co.
Tottori Dento KK	Tottori Electric Light Co.
Toyama Denki KK	Toyama Electric Co.
Toyama-ken	Toyama Prefecture
Toyo Boseki KK	Oriental Spinning Co.
Toyo Rayon KK	Oriental Rayon Co.
Toyo Soda Kogyo KK	Oriental Soda Industries Co.
Tsuetate Suiryoku Denki KK	Tsuetate Waterpower Electric Co.
Tsurugaoka Suiryoku Denki KK	Tsurugaoka Waterpower Electric Co.
Ube Cement KK	Ube Cement Co.
Ube Chisso Kogyo KK	Ube Nitrogen Industries Co.
Ube Soda Kogyo KK	Ube Soda Industries Co.
Ueda Suiryoku Denki KK	Ueda Waterpower Electric Co.
Ujigawa Denki KK	Ujigawa Electric Co.
Uryu Denki KK	Uryu Electric Co.
Watarase Suiden KK	Watarase Hydroelectric Co.
Watarikawa Suiryoku Denki KK	Watarikawa Waterpower Electric Co.
Yahagi Suiryoku KK	Yahagi Waterpower Co.
Yamagata Denki KK	Yamagata Electric Co.
Yamaguchi-ken	Yamaguchi Prefecture
Yokohama Denki KK	Yokohama Electric Co.

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1. ABOSHI KARYOKU STEAM PLANT

Approx. Lat. 34°47'
Long. 134°36'

Company: Nippon Hassoden KK; formerly Chugoku Godo Denki KK

Location: On the right bank of the Otsumo-gawa, on the shore of Harima-nada at 738, Tatsumi-aza, Oejima-oaza, Aboshi-machi, Iho-gun, Hyogo-ken

Installed Capacity (in kw): 16,000, as of Dec 1936. An unconfirmed report states that the capacity was increased 16,000 in 1937.

Importance: Rank in Japan - 141 ; rank in Osaka-Nagoya supply area - 65

Date of Construction: Completed Aug 1927; in operation Mar 1940

Details: Particular capacities (in kw) - 14,000 reg; 2,000 supp
Plant, external features - As of 1936, 2 chimneys, 300 feet high above ground level set aside from three-story building
Plant, equipment -
Boilers - 7 (incl 1 res) @ B&W-type, 200 lbs/in^2, 590° F, 4020 ft^2, B&W-make
4 (incl 1 res) @ B&W-type, 250 lbs/in^2, 706° F, 8019 ft^2, B&W-make
Turbines - 2 res @ 4300 hp, Zoelly-type, EW-make
1 @ 15,000 hp, 3-cylinder type, BBC-make
Generators - 2 res @ 3750 kva, 3-ph, 3500 v, 3600 rpm, 60 cyc, AEG and SS-makes
1 @ 12,500 kva, 3-ph, 6600 v, 3600 rpm, 60 cyc, BBC-make
Transformers - 4 (incl 1 res) @ 2500 kva, 1-ph, 3.5/15.75,16.5 kv, D-Y conn, water-cooled, 60 cyc, shell-type, Shibaura-make
4 (incl 1 res) @ 4200 kva, 3-ph, 6.6/15.75 kv, D-D conn, water-cooled, 60 cyc, shell-type, Shibaura-make
Other equipment - 4 condensers, 8 superheaters, 8 chain-grate stokers and 4 other mechanized stokers, 6 economizers, close heater type of feedwater heater, 1 exciter @ 20 kw, and 1 exciter @ 58.5 kw
Area served - Himeji-shi and environs in 1933

See: Photographs No. II-1, II-2
Figure No. II-1

Sources: Ohm 12/27 p.543, 6/31 supp p.7, 3/33 p.177; Ohm-sha Guide 1933 p.41; DnN 1940; ZKT 1939 p.1645; DnK; DJY 1927; DJY 1929 p.346

2. ABUKAWA HYDRO PLANT

Approx. Lat. 34°20'
Long. 131°30'

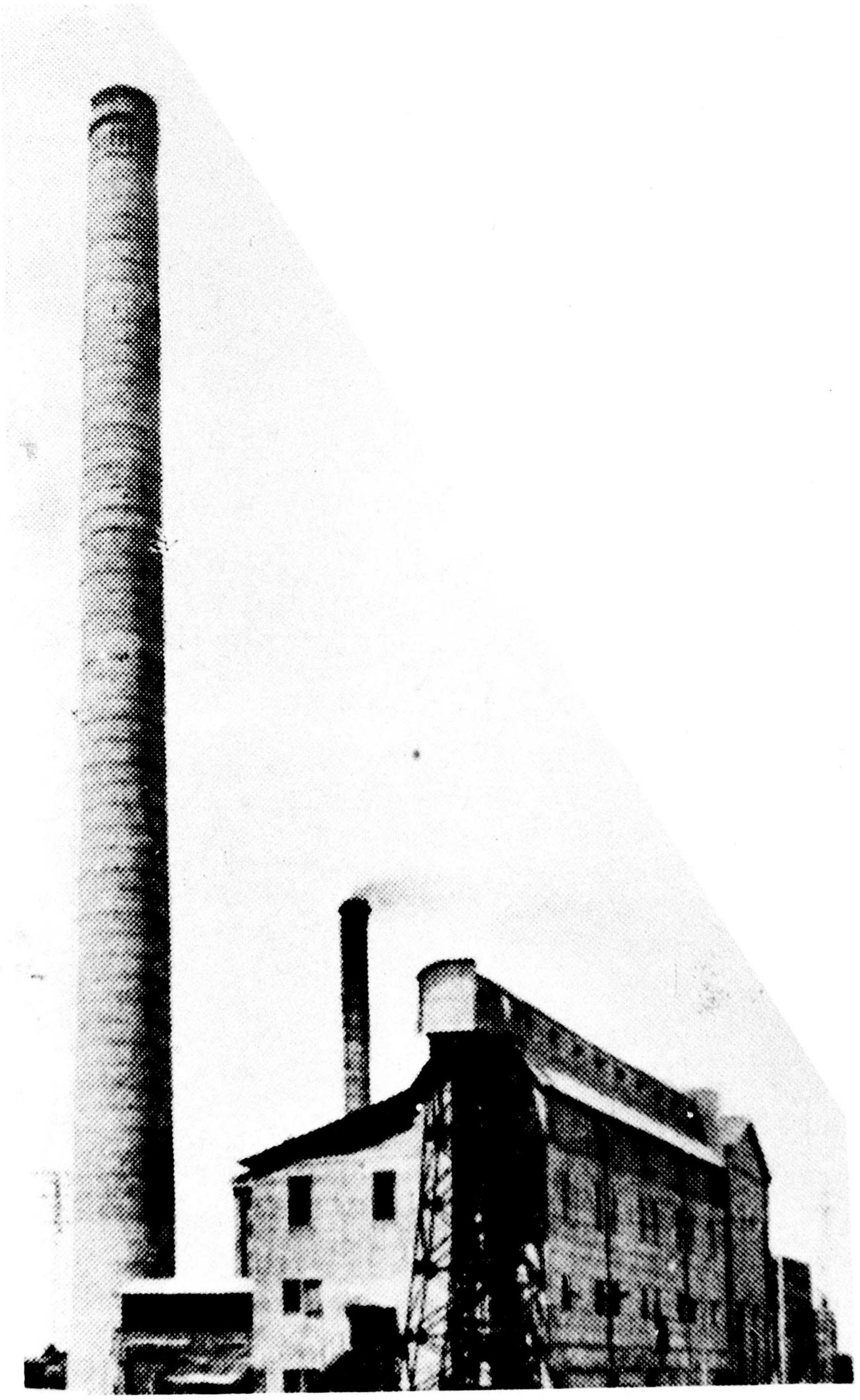
Company: Yamaguchi-ken

Location: Plant - 3738, Araya-oaza, Kawakami-mura, Abu-gun, Yamaguchi-ken

Capacity Commonly in Use (in kw): 2840, as of Dec 1936

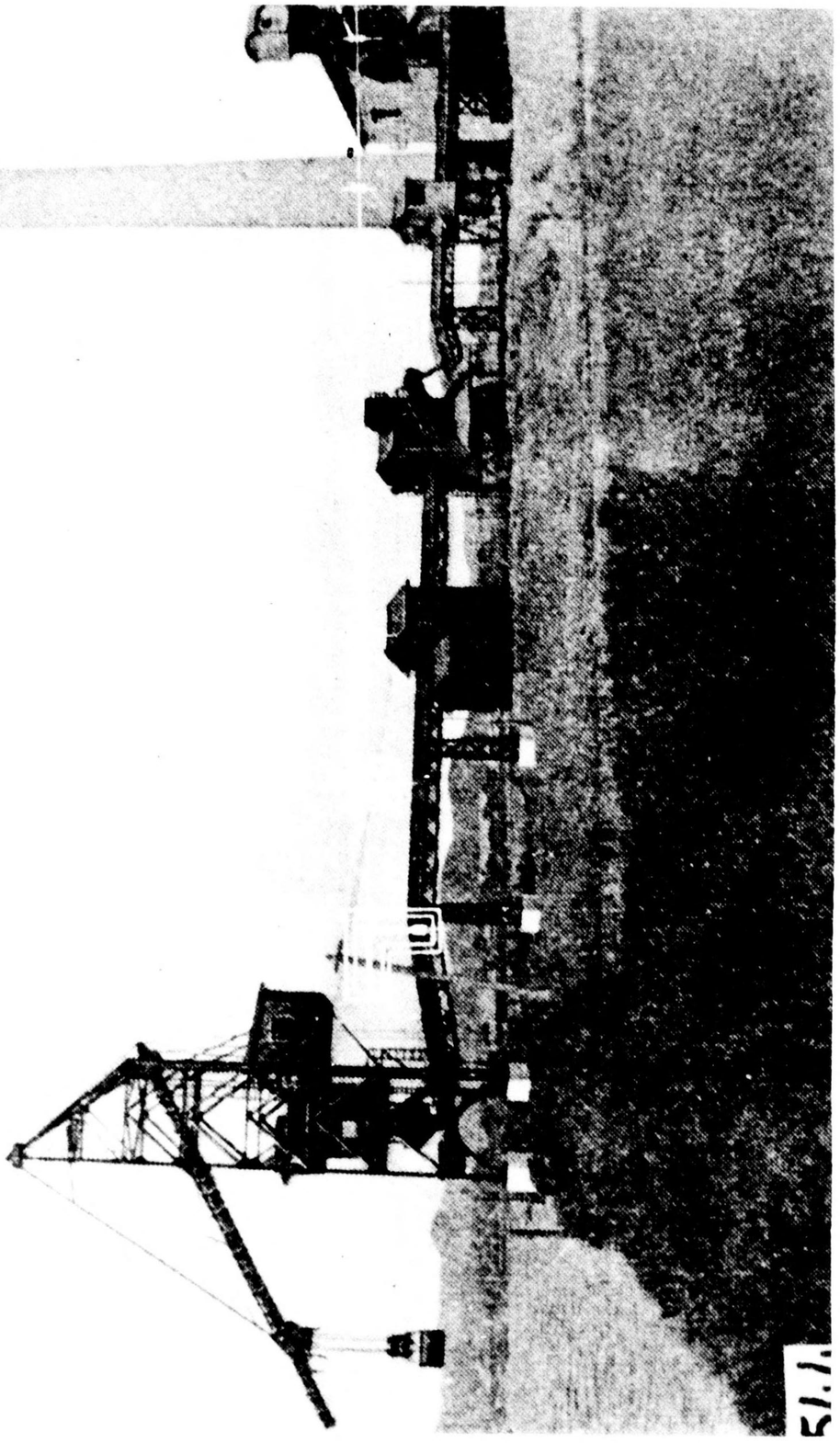
Importance: Rank in Japan - 250+ ; rank in Chugoku supply area - 25+

By [illegible] NARA. Date 4/9/11



Photograph No. II-1 Aboshi Karyoku Steam Plant in 1936

By _____ NARA. Date 4-5-77



Photograph No. II-2 Coal handling equipment of
Aboshi Karyoku Steam Plant in 1935

PROVISIONAL EDITION

Figure II-1
CONFIDENTIAL

ABOSHI AND SHIKAMA NO. 3 STEAM PLANTS
HYOGO-KEN

BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1906
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEET 35-8.

0 1 2 3 4 MILES

0 1 2 3 4 KILOMETERS

Reliability Code: 2B-- 2B--1

LEGEND

- SETTLEMENT CENTER
- RAILROAD
- PRINCIPAL HIGHWAY
- SECONDARY HIGHWAY
- BRIDGE - SELECTED
- ▲ 465 SPOT HEIGHT (IN FEET)

LOCATION OF MAP

KOREA · HOKKAIDO · HONSHU · SHIKOKU · KYUSHU · Tokyo · JAPAN
Approximate Scale 0 300 MILES

MAP NO. 2404
8 SEPTEMBER 1943

COMPILED AND DRAWN IN THE BRANCH OF RESEARCH AND ANALYSIS, OSS
LITHOGRAPHED IN THE REPRODUCTION BRANCH, OSS

By ____ NARA. Date 4/9/11

Source of Power: Abu-kawa

Details: Particular capacities (in kw) - *2800 installed cap; 1220 reg; 1620 spec
Eff head - 153.98 ft
Plant, equipment -
Turbines - 2 @ 2000 hp, Francis-type, Hitachi-make
Generators - 2 @ 1750 kva, 3-ph, 600 rpm, 60 cyc, Hitachi-make
Transformers - 4 (incl 1 res) @ 1200 kva, 1-ph, 3.1,3.2,3.3,3.4/44 kv, D-D conn, water-cooled, 50 cyc, shell-type, Hitachi-make

Sources: DnN 1940; ZKT 1939 p.1910; DnK; DJY 1927; DJY 1929 p.364; TD Map

3. ABUTA HYDRO PLANT — Approx. Lat. 42°30' Long. 140°45'30"

Company: Muroran Dento KK; formerly Hokkaido Tanko Kisen KK

Location: Plant - Abuta Kaigan-aza, Abuta-machi, Abuta-gun, Hokkaido; on the seashore west of Abuta
Intake - Shore of Shotan-ko in Abuta-machi, Abuta-gun, Hokkaido

Capacity Commonly in Use (in kw): 10,256, as of Jan 1940

Importance: Rank in Japan - 219 ; rank in Hokkaido supply area - 10

Source of Power: Doya-ko

Date of Construction: Construction begun in Aug 1937 and completed late in 1939; in operation Mar 1940

Details: Particular capacities (in kw) - 19,800 installed cap; 9591 reg; 665 spec; 10,256 reg pk
Layout - Aqueduct-type, using Doya-ko as reservoir
Eff head - 77.6 m; flow - 17.1 m^3/sec
Aqueduct - reinforced concrete tunnel, 3867 m long
Surge tank - Of reinforced concrete construction, 32 m high, 20 m inner diam
Plant, equipment -
Turbines - 3 (incl 1 res) @ 8500 kw, Francis-type, vertical-shaft
Generators - 3 (incl 1 res) @ 8125 kva, 80% pf, 3-ph, 6600 v, 375 rpm, 50 cyc

Sources: DnN 1940; DGS 11/37 p.1313; Ohm 11/37 p.1187; DnGZ 9/37 p.(139), 1/41 p.(10); SR 1/39 p.4, 1/40 p.4; KN 1938 p.198

4. ACHIGAWA NO. 2 HYDRO PLANT — Approx. Lat. 35°06'30" Long. 137°49'50"

Company: Chuo Denryoku KK; formerly Ina Denki Tetsudo KK

By _____ NARA. Date 4-9-77

Location: Plant - 893, Shimagakigai-aza, Komaba-oaza, Auchi-mura, Shimo Ina-gun, Nagano-ken

Capacity Commonly in Use (in kw): 5320, as of Dec 1937

Importance: Rank in Japan -250+ ; rank in Tokyo supply area - 100+

Source of Power: Achi-gawa of the Tenryu-gawa system

Date of Construction: Completed Oct 1937; in operation Mar 1940

Details: Particular capacities (in kw) - 2660 reg; 2660 spec
Layout - Aqueduct-type

Sources: DnN 1940; Ohm 1/38 p.134; DnGZ 9/37 p.(139); DGS 4/37 p.411

5. ADACHI HYDRO PLANT

Approx. Lat. 37°35'
Long. 140°30'

Company: Tohoku Shinko Denryoku KK

Location: Plant - Kami Kawasaki-mura, Adachi-gun, Fukushima-ken. About 5 miles south of Horai Hydro Plant.

Capacity Commonly in Use (in kw): 6400 (see Date of Construction)

Importance: Rank in Japan - 250+ ; rank in Tohoku supply area - 17

Source of Power: Abukuma-kawa

Date of Construction: Scheduled for completion in 1942

Sources: Ohm 8/38 pp.863-868

AGANOGAWA NO. 1 HYDRO PLANT - See KANOSE HYDRO PLANT

AGANOGAWA NO. 2 HYDRO PLANT - See TOYOMI HYDRO PLANT

6. AIBETSU HYDRO PLANT

Approx. Lat. 53°55'
Long. 142°35'

Company: Dai Nippon Denryoku KK; formerly Hokkaido Dento KK

Location: Plant - Aibetsu Harano-aza, Aibetsu-mura, Kamikawa-gun, Hokkaido

Capacity Commonly in Use (in kw): 5100, as of Dec 1934

By [illegible] NARA. Date 4/9/11

Importance: Rank in Japan - 250 + ; rank in Hokkaido supply area - 15 +

Source of Power: Ishikari-kawa

Date of Construction: Founded Feb 1925; in operation Mar 1940

Details: Particular capacities (in kw) - *4800 installed cap; 3480 reg; 1620 spec
Eff head - 103 ft
Plant, equipment -
Turbines - 1 @ 7100 hp, Francis-type, vertical-shaft, Hitachi-make
Generators - 1 @ 6000 kva, 3-ph, 6600 v, 214 rpm, 50 cyc, Hitachi-make
Transformers - 4 (incl 1 res) @ 2000 kva, 1-ph, 6.6,6.45,6.3/66 kv, D-D conn, water-cooled, 50 cyc, shell-type, Hitachi-make

Sources: DnN 1940; ZKT 1939 p.1652; DnK; DJY 1927; DJY 1929 p.406; TD Map

7. AIMOTO HYDRO PLANT

Approx. Lat. 36°51'30"
Long. 137°30'30"

Company: Toyama-ken

Location: Plant - 1, 3 Matsugadaira-aza, Funami-machi, Shimo Niikawa-gun, Toyama-ken. Built on communal land on right bank of the Kurobe-gawa near the Aimoto Bridge.

Capacity Commonly in Use (in kw): 29,700, as of Dec 1936

Importance: Rank in Japan - 80 ; rank in Osaka-Nagoya supply area - 35; rank in Tokyo supply area - 27
As of June 1936, all power was supplied to the Nippon-kai Denki KK to be used by the Higashi Iwase factory of the Nichiman Aluminum KK

Source of Power: Kurobe-gawa and the discharge from the Yanagawara Hydro Plant of Nippon Denryoku KK

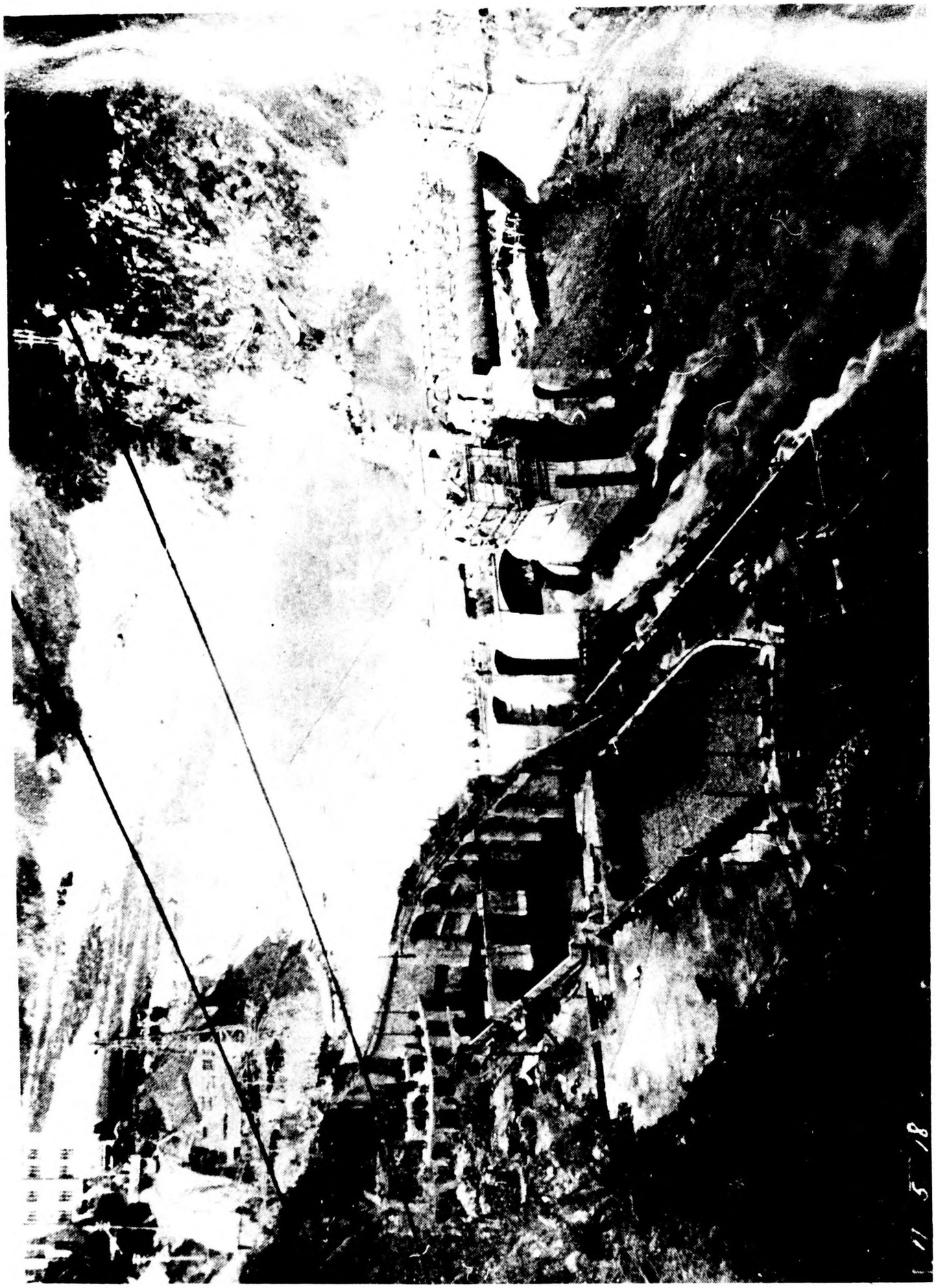
Date of Construction: Construction begun Aug 1934 and completed June 1936; in operation Mar 1940

Details: Particular capacities (in kw) - *30,000 installed cap; 12,000 reg; 17,700 spec
Layout - Aqueduct-type
Eff head - 71.52 m; flow - 50.09 m^3/sec
Dam - 90 m long, 11 m high with 3 gates
Intake - Gates, 24.25 m long and 3.33 m high
Aqueduct - 7.5 km long. At one point the aqueduct passes over a bridge.
Forebay - Box-shape
Penstocks - 2
Fishway - 5.5 m wide
Log chute - 2.5 m wide, 35 m long
Plant, external features - 4 and 5 stories high, steel frame and reinforced concrete construction with transformer station on the roof

by _____ NARA. Date 4-5-77

Photograph No. II-3 Aimoto Hydro Plant in 1936

By _____ NARA. Date 4-7-77



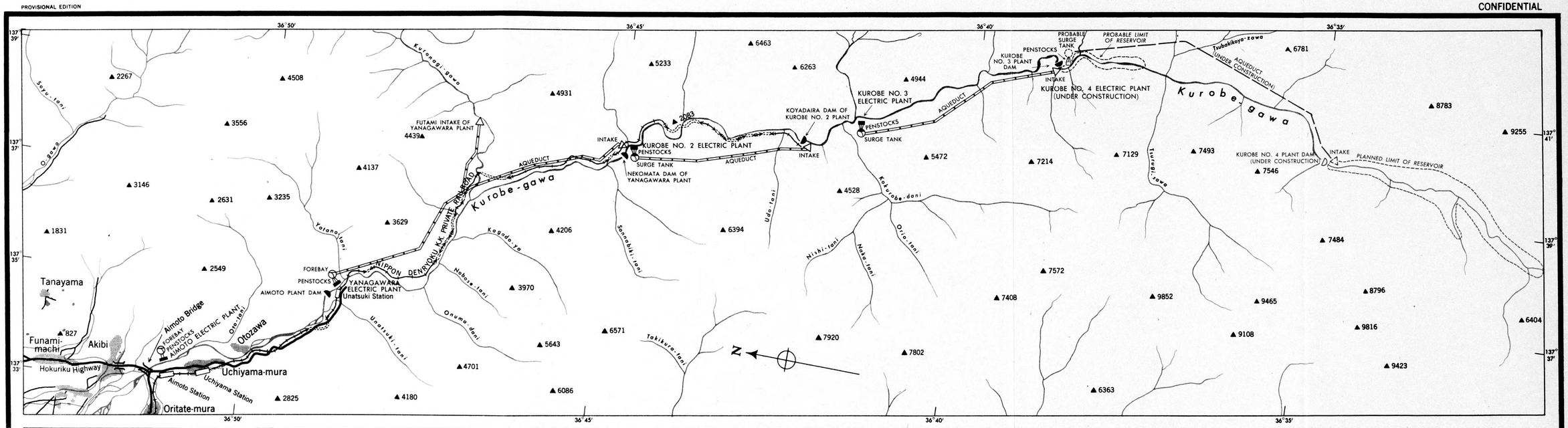
Photograph No. II-4 Aimoto Hydro Plant intake and dam in 1936. The Yanagawara Hydro Plant is in the upper left-hand corner.

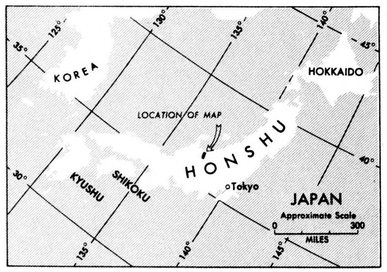
By _____ NARA. Date 1-5-77

Photograph No. II-5 Aimoto Hydro Plant Aqueduct Bridge in 1936

PROVISIONAL EDITION

Figure II-2
CONFIDENTIAL





HYDRO PLANTS ON THE KUROBE-GAWA

TOYAMA-KEN

0 1 2 3 4 5
MILES
0 1 2 3 4 5
KILOMETERS

BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1930
W. D. M. C. FILE NO. JAPAN S30-JGS-50, SHEETS 59-7, 59-8, 54-5.

Reliability Code: 2B--1B--1

- SETTLEMENT
- RAILROAD
- LIGHT RAILROAD
- TUNNEL
- PRINCIPAL HIGHWAY
- SECONDARY ROAD
- BRIDGE - SELECTED
- ▲9816 SPOT HEIGHT (IN FEET)

MAP NO. 2610
6 OCTOBER 1943

COMPILED AND DRAWN IN THE BRANCH OF RESEARCH AND ANALYSIS, OSS
LITHOGRAPHED IN THE REPRODUCTION BRANCH, OSS

Plant, equipment -
Turbines - 2 @ 16,560 kw, vertical-shaft, Hitachi-make
Generators - 2 @ 18,750 kva, 80% pf, 11,000 v, 214/257 rpm, 50/60 cyc, Hitachi-make
Transformers - 2 @ 3-ph, 11/66 kv
Other equipment - One-man control equipment has been installed.

See: Photographs No. II-3, II-4, II-5
Figure No. II-2

Sources: DnN 1940; Ohm 6/34 p.433, 9/36 p.911; DGS Kaimu 1936 p.58; DnGZ 6/36 p.(122); DnK; HSG pp.198,211,231,233,283,318,324,349; ZKT 1939 p.1909

8. AINOSAWA HYDRO PLANT

Approx. Lat. 35°41'
Long. 137°42'

Company: Kiso Hatsuden KK

Location: Plant - Matsubara-aza, Suhara-oaza, Okuwa-mura, Nishi Tsukuma-gun, Nagano-ken

Capacity Commonly in Use (in kw): 6000, as of Mar 1938

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Ina-kawa of the Kiso-gawa system

Date of Construction: Construction started July 1936 and completed Mar 1938

Details: Particular capacities (in kw) - *6500 installed cap; 2100 reg; 3900 spec
Layout - Aqueduct-type
Eff head - 245 m
Plant, equipment -
Turbines - 1 @ 6500 kw; 2 wheel, 2 nozzle Pelton-type; Hitachi-make
Generators - 1 @ unknown cap, 3-ph, 514 rpm, 60 cyc, Hitachi-make

Sources: Ohm 10/36 p.1007, 6/38 p.746; DnGZ 9/37 p.(139); DGS 4/37 p.111; HH 1/39 p.4; KN 1938 p.199

9. AINOURA STEAM PLANT

Approx. Lat. 33°12'30"
Long. 129°39'

Company: Toho Denryoku KK

Location: On the seashore at Sakuho-aza, Hatanaka-oaza, Ainoura-machi, Kita Matsuura-gun, Nagasaki-ken

Installed Capacity (in kw): 30,000, as of Aug 1939; 50,000 when completed (see Date of Construction)

Importance: Rank in Japan - 74 ; rank in Kyushu supply area - 12

Date of Construction: License to construct received Aug 1937; completion planned 1939. 30,000 kw in operation Aug 1939 and additional 20,000 kw scheduled as of Aug 1939

Details: Plant, equipment -
Fuel supply - A new type level luffing crane with a cap of 150 tons per hr, grab bucket cap of 2½ tons, was being used in Oct 1940 to convey coal from barges or freighters.
Turbines - 1 @ 30,000 kw (22,500 kw eco cap), Zoelly-type, horizontal-shaft, 3 extraction stages, Mitsubishi-make
Generators - 1 @ 30,000 kw, 3-ph, 3600 rpm, 60 cyc, Mitsubishi-make

Sources: Ohm 11/37 p.1187, 10/39 p.937; HH 11/40 p.(2)

AINUMACHI HYDRO PLANT - See AINUMANAI HYDRO PLANT

10. AINUMANAI HYDRO PLANT — Approx. Lat. 42°05' Long. 140°05'

Company: Teikoku Denryoku KK; formerly Hakodate Suiden KK

Location: Plant - Nagaochi-aza, Ainumanai-oaza, Ainumanai-mura, Nishi-gun, Hokkaido

Capacity Commonly in Use (in kw): 2000, as of Dec 1936

Importance: Rank in Japan - 250+ ; rank in Hokkaido supply area - 15+

Source of Power: Ainumanai-kawa

Date of Construction: Completed 1930; in operation Mar 1940

Details: Particular capacities (in kw) - 300 reg ; 1700 spec; 2000 reg pk
Layout - Dam-type
Dam - 90.6 m long
This plant operates on 60 cyc

Sources: DnN 1940; Ohm 11/31 p.571, 10/33 p.601, 6/34 p.433; DnK; DnGZ 7/37

AIOURA STEAM PLANT - See AINOURA STEAM PLANT

AITANI HYDRO PLANT - See IYA HYDRO PLANT

11. AJIKAWA STEAM PLANT

Approx. Lat. 34°41'30"
Long. 135°29'30"

Company: Osaka-shi

Location: On north bank of Aji-kawa at 2-chome, Kita Ajikawakami-dori, Konohana-ku, Osaka-shi, Osaka-fu

Installed Capacity (in kw): 18,000 (see Date of Construction)

Importance: Rank in Japan - 128 ; rank in Osaka-Nagoya supply area - 57

Date of Construction: Founded June 1910. In Dec 1936 capacity was 10,000 kw. In Mar 1940 new capacity of 8000 kw was being added. This extension is probably complete.

Details: Particular capacities (in kw) - 16,000 reg; 2000 res
Plant, external features - In 1936, of brick construction, 3 stories high with 8 closely packed chimneys in 2 rows. External features of addition are unknown.
Plant, equipment -
Fuel supply - Coal supplied by barges or freighters. Two conveyor belts on premises
Feedwater - Probably from Aji-kawa. Two water towers are located nearby.
Boilers - 19 (incl 3 res) @ B&W-type, 160 lbs/in^2, 5346 ft^2, B&W-make
Additional boiler plant has been installed
Turbines - 5 (incl 1 res) @ 4500 hp, Parsons-type, W-make
At least 1 more has been added.
Generators - 5 (incl 1 res) @ 3000 kva, 3-ph, 11,000 v, 1200 rpm, 60 cyc, W-make
At least 1 more has been added.
Other equipment - 5 condensers, 19 superheaters, 4 economizers, 18 chain-grate stokers. Equipment of similar types has been added.
Area served - Osaka-shi

See: Photograph No. II-6
Map of the City of Osaka

Sources: DnN 1940; Ohm 2/36 p.212, 6/31 supp p.7; DnGZ 10/37 p.(143); ZKT 1939 p.1644; DnK; Ohm-sha Guide 1933 p.48; DJY 1927; DJY 1929 pp.265,340

12. AJIKAWA HIGASHI STEAM PLANT

Approx. Lat. 34°41'30"
Long. 135°29'45"

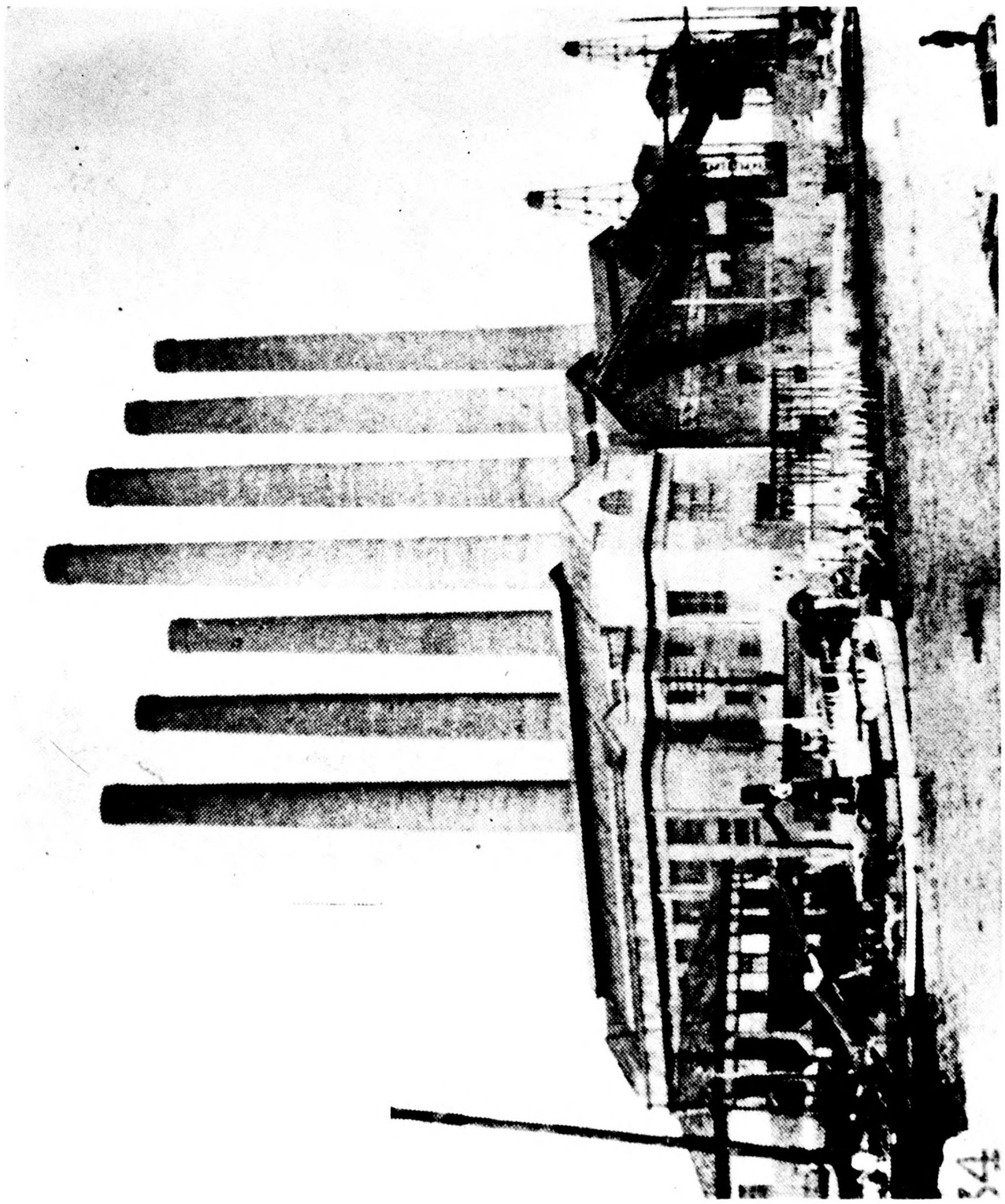
Company: Nippon Hassoden KK; formerly Daido Denryoku KK

Location: On north bank of Aji-kawa at 17 of 2-chome, Kita Ajikawakami-dori, Konohana-ku, Osaka-shi, Osaka-fu

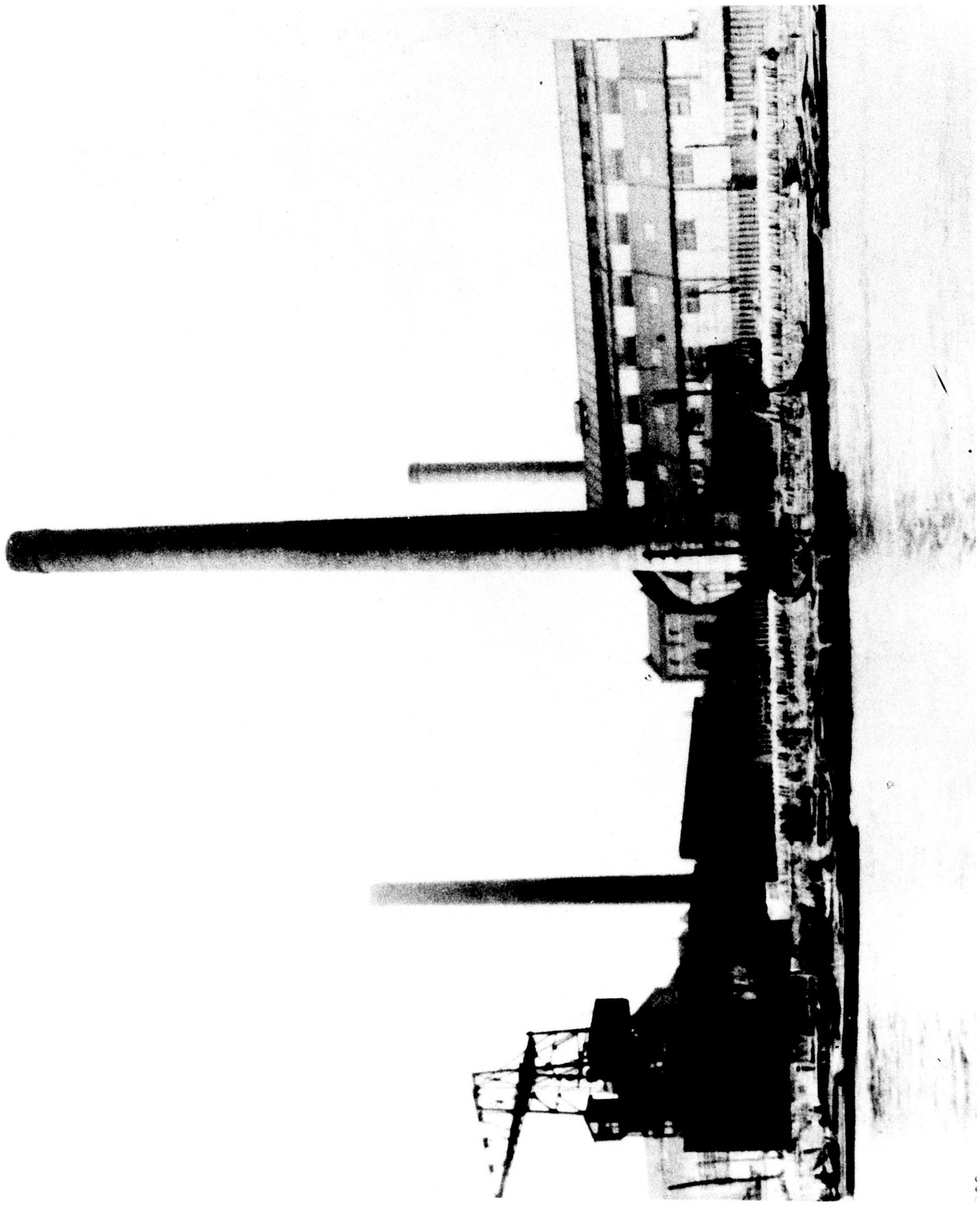
Installed Capacity (in kw): 18,000, as of Dec 1936

Importance: Rank in Japan - 128 ; rank in Osaka-Nagoya supply area - 57

Date of Construction: Completed Apr 1913 and extension completed May 1918; in operation Mar 1940



Photograph No. II-6 Ajikawa Steam Plant in 1928



Photograph No. II-7 Ajikawa Higashi Steam Plant

Details: Plant, external features - Concrete and galvanized iron building, approximately 175 x 70 ft, with double hip roof, 1 concrete chimney and 2 other chimneys nearby
Plant, equipment -
Fuel supply - 1 crane and 1 conveyor belt carry coal from barges or freighters in Aji-kawa
Feedwater - Probably from Aji-kawa
Boilers - 8 (incl 2 res) @ B&W-type, 250 lbs/in^2, 6182 ft^2, B&W-make
14 (incl 4 res) @ B&W-type, 160 lbs/in^2, 5346 ft^2, B&W-make
Turbines - 1 @ 10,000 kw, Parsons-type, horizontal-shaft, Mitsubishi-make
2 (incl 1 res) @ 4000 kw, Parsons-type, horizontal shaft, W-make
Generators - 1 @ 12,500 kva, 3-ph, 11,000 v, 1800 rpm, 60 cyc, Mitsubishi-make
2 (incl 1 res) @ 5000 kva, 3-ph, 11,000 v, 1800 rpm, 60 cyc, W-make
Other equipment - 2 exciters @ 100 kw, 3 condensers, 1 open heater-type feedwater heater, 22 superheaters, 6 economizers, underfeed and chain-grate types of stokers
Area served - Osaka-shi

See: Photograph No. II-7
Map of the City of Osaka

Sources: DnN 1940; Ohm 6/31 supp p.7, 8/38 p.434; Ohm-sha Guide 1933 p.44; DnK; DJY 1927; DJY 1929 p.342; ZKT 1939 p.1644

13. AKABANE STEAM PLANT — Approx. Lat. 35°46'30" Long. 139°44'

Company: Tetsudo-sho

Location: ½ mile east of Akabane station on the Tokyo-Omiya railway line at 1082 Shimo-cho, Oji-ku, Tokyo-shi, Tokyo-fu

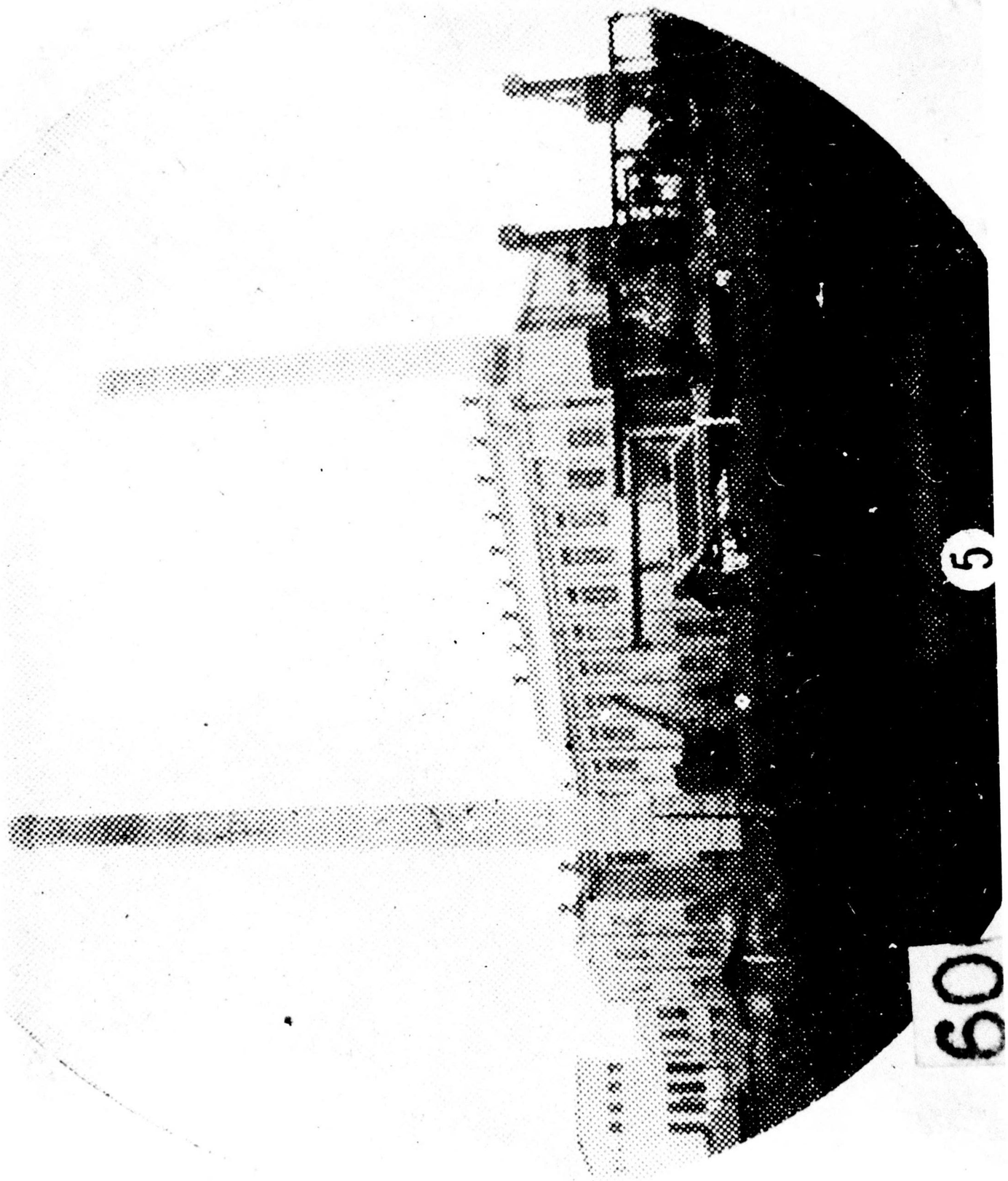
Installed Capacity (in kw): *16,000, as of 1933

Importance: Rank in Japan - 141 ; rank in Tokyo supply area - 55
Supplies Imperial Government Railways in Tokyo area

Date of Construction: Completed Nov 1922; in operation Mar 1940

Details: Particular capacities (in kw) - 12,500 reg; 3500 res
Plant, external features - Of natural color concrete, with 2 concrete chimneys
Plant, equipment -
Fuel supply - By rail
Boilers - 8 @ Garbe-type, 15.1 kg/cm^2, 451 m^2, SB-make
Turbines - 3 @ 6000 kw, Parsons semi-double-flow type, W-make
Generators - 3 @ 6667 kva, 11,000 v, 3000 rpm, 50 cyc, W-make
Other equipment - 1 exciter @ 50 kw, 3 condensers, 8 SB-type superheaters, 4 Green-type economizers, underfeed and chain-grate stoking

See: Photograph No. II-8
Map of the City of Tokyo



Photograph No. II-8 Akabane Steam Plant in 1932

Sources: DnN 1940; Ohm 11/32 p.568, 6/31 supp p.7; Ohm-sha Guide 1928 p.22, 1933 p.45; DnK

14. AKAGAWA HYDRO PLANT

Approx. Lat. 36°59'
Long. 139°46'30"

Company: Fukushima Dento KK; formerly Shiohara Densha KK

Location: Plant - Kuretsubo-aza, Kami Shiohara-oaza, Shiohara-machi, Shioya-gun, Tochigi-ken

Capacity Commonly in Use (in kw): 1000, as of May 1930

Importance: Rank in Japan - 250+ ; rank in Tokyo supply area - 100+

Source of Power: Tobari-gawa system

Date of Construction: Unknown; in operation as early as May 1930 and as recently as Mar 1940

Details: Particular capacities (in kw) - 538 reg; 462 spec
This plant operates on 50 cyc

Sources: DnN 1940; Ohm 8/30 p.415

15. AKAIKE STEAM PLANT

Approx. Lat. 33°41'30"
Long. 130°46'

Company: Meiji Kogyo KK

Location: On the west bank of the Hikosan-gawa, between the river and the railroad in Akaike-oaza, Ueno-mura, Tagawa-gun, Fukuoka-ken

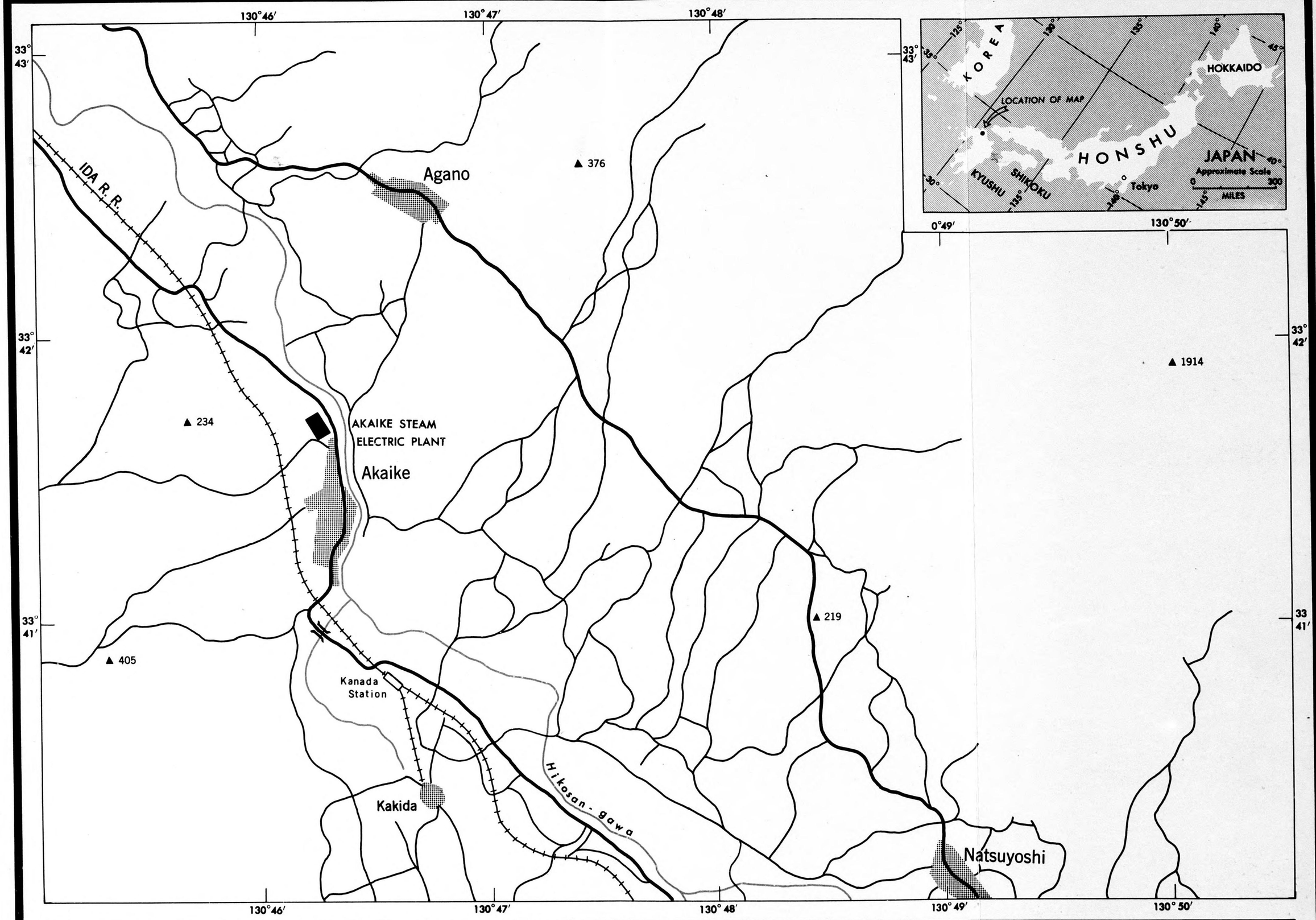
Installed Capacity (in kw): *10,200, as of 1933

Importance: Rank in Japan - 220 ; rank in Kyushu supply area -28
Supplies Meiji Kogyo mine

Date of Construction: Completed Dec 1922; in operation as recently as Apr 1931

Details: Plant, equipment -
Boilers - 3 @ Garbe-type, 13 kg/cm^2, 250 m^2, SB-make
2 @ Garbe-type, 13 kg/cm^2, 475 m^2, SB-make
1 @ Takuma-type, 13 kg/cm^2, 355 m^2, Osaka Kisha-make
1 @ Takuma-type, 13 kg/cm^2, 496 m^2, Osaka Kisha-make
Turbines - 2 @ 2000 kw, BBC-type, BBC-make
1 @ 5000 kw, BBC-type, BBC-make
Generators - 1 @ 6500 kva, 3-ph, 3300 v, 3000 rpm, 50 cyc, BBC-make
1 @ 6250 kva, 3-ph, 3300 v, 3000 rpm, 50 cyc, BBC-make
Transformers - 3 @ 2500 kva, 1-ph, D-D conn, 3.3/22 kv, water-cooled, shell-type, Yasukawa-make
3 @ 1250, 1-ph, D-D conn, 3.3/11 kv, self-cooled, shell-type, Yasukawa-make

PROVISIONAL EDITION



SETTLEMENT CENTER
PRINCIPAL HIGHWAY
SECONDARY ROAD
RAILROAD
BRIDGE - SELECTED
▲ 405 SPOT HEIGHT (IN FEET)

AKAIKE STEAM PLANT
FUKUOKA-KEN

BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1914
W. D. M. C. FILE NO. JAPAN S30-JGS-50, SHEET NO. 16-2

0 ½ 1 1½ 2 MILES
0 ½ 1 1½ 2 KILOMETERS

Reliability Code: 2B--1B--1

MAP NO. 2405
7 SEPTEMBER 1943

COMPILED AND DRAWN IN THE BRANCH OF RESEARCH AND ANALYSIS, OSS
LITHOGRAPHED IN THE REPRODUCTION BRANCH, OSS

3 @ 150, 1-ph, D-D conn, 3.3/21 kv, self-cooled, shell-type, Yasukawa-make
4 @ 100, 1-ph, D-D conn, 3.3/21 kv, self-cooled, shell-type, Yasukawa-make
Other equipment - 3 condensers, 3 open-type feedwater heaters, 7 superheaters, 4 travelling stokers and 3 pulverized-coal firers, 3 Green-type economizers, 2 exciters @ 17 kw

See: Figure No. II-3

Sources: Ohm-sha Guide 1933 p.53; Ohm 6/31 supp p.7

16. AKAKURA HYDRO PLANT — Approx. Lat. 35°45'
Long. 139°40'

Company: Niigata Suiryoku Denki KK

Location: Plant - Toyomi-mura, Higashi Kambara-gun, Niigata-ken

Capacity Commonly in Use (in kw): 2237, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Tokyo supply area - 100+

Source of Power: Mi-kawa of the Agano-gawa system

Date of Construction: Completed Oct 1926; in operation Mar 1940

Details: Particular capacities (in kw) - *2240 installed cap; 1468 reg; 769 spec
Eff head - 222 ft
Plant, equipment -
Turbines - 1 @ 3700 hp, Francis-type, Dengyosha-make
Generators - 1 @ 2800 kva, 3-ph, 6600 v, 600 rpm, 50 cyc, Shibaura-make

Sources: DnN 1940; Ohm 5/28 p.267, 8/28 p.406; DnK; DJY 1929 pp.283, 288; TD Map

17. AKAMATSU HYDRO PLANT — Approx. Lat. 36°11'
Long. 137°48'

Company: Chuo Denki KK

Location: Plant - Akamatsu-oaza, Hata-mura, Higashi Tsukuma-gun, Nagano-ken

Capacity Commonly in Use (in kw): 4290 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Tokyo supply area - 100+

Source of Power: Azusa-gawa of the Sai-kawa of the Shinano-gawa system

Date of Construction: Construction started Jan 1938 at which time completion was planned for 1939; it is believed to have been completed since.

Details: Particular capacities (in kw) - 2145 reg; 2145 spec

Sources: Ohm 4/38 p.414

18. AKANUMA HYDRO PLANT

Approx. Lat. 40°35'30"
Long. 141°11'

Company: Tohoku Shinko Denryoku KK

Location: Plant - Akanuma-oaza, Sambongi-machi, Kami Kita-gun, Aomori-ken

Capacity Commonly in Use (in kw): 4240 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Tohoku supply area - 20+

Source of Power: Okuirase-kawa, which has its source in Towada-ko

Date of Construction: To be completed after 1942

Details: Particular capacities (in kw) - 3560 reg; 690 spec
Eff head - 33 m; flow - 16 m^3/sec
Capacity of this plant will fall only slightly in dry season

Sources: Ohm 8/38 p.867; DGS 1/40 p.116

19. AKASHI NO. 1 STEAM PLANT

Approx. Lat. 34°38'
Long. 134°59'

Company: Ujigawa Denki KK

Location: Akashi-shi, Hyogo-ken

Installed Capacity (in kw): 2350, as of Sept 1927

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Date of Construction: Unknown; in operation Sept 1927

Details: Particular capacities (in kw) - 1000 reg; 450 supp, 900 res

Sources: Ohm 12/27 p.540

20. AKECHIGAWA HYDRO PLANT

Approx. Lat. 35°14'30"
Long. 137°23'

Company: Toho Denryoku KK; formerly Chuo Denryoku KK, Chubu Denryoku KK

Location: Plant - 1 of 2465 Kawagawawatari-aza, Kushihara-mura, Ena-gun, Gifu-ken

Capacity Commonly in Use (in kw): 1000, as of July 1935

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100-

Source of Power: Akechi-gawa of the Yahagi-gawa system and Ohira-kawa of the Takanami-kawa system

Date of Construction: Completed July 1935; in operation Mar 1940

Details: Particular capacities (in kw) - 700 reg; 300 spec
This plant operates on 60 cyc

Sources: DnN 1940; Ohm 4/31 p.212, 8/34 p.583, 10/35 p.1034; DnGZ 5/36 p.(417)

21. AKIBETSU HYDRO PLANT — Approx. Lat. 43°17'30" Long. 144°05'30"

Company: Dai Nippon Denryoku KK; formerly Hokkaido Dento KK

Location: Plant - Akibetsu-aza, Toribetsu-oaza, Shitakara-mura, Akan-gun, Hokkaido

Capacity Commonly in Use (in kw): 6000, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Hokkaido supply area - 15+

Source of Power: Akan-gawa

Date of Construction: Founded Aug 1920; in operation Mar 1940

Details: Particular capacities (in kw) - *5600 installed cap; 4800 reg; 1200 spec
Plant, equipment -
Turbines - 2 @ 4000 hp, Francis-type, horizontal-shaft, Hitachi-make
Generators - 2 @ 3500 kva, 3-ph, 6600 v, 600 rpm, 50 cyc, Hitachi-make
Transformers - 4 (incl 1 res) @ 2300 kva, 1-ph, 6.6/55 kv, D-D conn, water-cooled, 50 cyc, shell-type, Hitachi-make
4 (incl 1 res) @ 900 kva, 1-ph, 6.6/55 kv, water-cooled, 50 cyc, shell-type, Shibaura-make

Sources: DnN 1940; Ohm 6/31 supp p.7; ZKT 1939 p.1652; DnK; DJY 1927; DJY 1929 pp.292,406; TD Map

22. AKIMOTO NO. 1 HYDRO PLANT — Approx. Lat. 37°39' Long. 140°06'

Company: Tokyo Dento KK

Location: Plant - Azuma-mura, Yama-gun, Fukushima-ken

Capacity Commonly in Use (in kw): 8100 kw (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Tokyo supply area - 85, if completed

Source of Power: Onogawa-ko, Hinokibara-ko, and Akimoto-ko by way of the Nagase-kawa of the Agano-gawa system

Date of Construction: In planning stage Oct 1936; to be built after Akimoto No. 2 Hydro Plant. There is no evidence that this plant has been constructed.

Details: Eff head - 460 ft

Sources: DGS Kaimu 1936 p.94

23. AKIMOTO NO. 2 HYDRO PLANT

Approx. Lat. 37°39'
Long. 140°06'30"

Company: Tokyo Dento KK

Location: Plant - Wakanomiya-oaza, Azuma-mura, Yama-gun, Fukushima-ken

Capacity Commonly in Use (in kw): 48,160, as of April 1940

Importance: Rank in Japan - 44 ; rank in Tokyo supply area - 15
This plant was intended to fill power deficiency in dry season.

Source of Power: Onogawa-ko, Hinokibara-ko and Akimoto-ko by way of the course of the Nagase-kawa of the Agano-gawa system

Date of Construction: Completed Apr 1940

Details: Particular capacities (in kw) - 48,160 installed cap; 18,100 reg; 30,060 spec. (It was planned that this plant would have a regular peak of 95,000. It is not known if sufficient equipment has been installed.)
Layout - Aqueduct-type
Eff head - 552 ft
Reservoirs - Akimoto-ko with 32,800,000 m^3 cap, Hinokibara-ko with 117,000,000 m^3 cap, and Onogawa-ko with 11,900,000 m^3 cap
Penstocks - 2
Plant, external features - Of reinforced concrete construction, 3 stories high
Plant, equipment -
Turbines - 2 @ unknown cap, vertical-shaft
Generators - 2 @ 28,000 kva, 86% pf, 11,000 v, 375 rpm, 50 cyc, Shibaura-make
Transformers - 2 @ 28,000 kva, 161/10.5 kv, air-cooled, 50 cyc

Sources: Ohm 3/38 p.321; SR 11/39 p.(1), 5/40 p.(2), 1/39 p.5, 1/40 p.4; DGS Kaimu 1936 p.94

24. AKINA DIESEL PLANT

Approx. Lat. 28°27'
Long. 129°33'

Company: Koniya Suiryoku Denki KK

Location: Akina-oaza, Higashi Ho-mura, Oshima-gun, Kagoshima-ken on Amami O-Shima

Installed Capacity (in kw): 1925, as of Sept 1930

Importance: Rank in Japan - 250+ ; rank in Kyushu supply area - 50+

Date of Construction: Unknown; in operation as early as Sept 1930 and as recently as Mar 1940

Details: Particular capacities (in kw) - 60 reg; 1865 supp
This plant operates its reg cap (60 kw) on water and its supp cap on Diesel oil, both on 60 cyc

Sources: DnN 1940; Ohm 12/30 p.607

25. AKISHINA STEAM PLANT Approx. Lat. 36°20'30"
Long. 137°56'

Company: Shinshu Denki KK; formerly Azumi Denki KK

Location: Akishina-aza, Nakagawate-mura, Higashi Tsukuma-gun, Nagano-ken

Installed Capacity (in kw): 3500, as of Dec 1936

Importance: Rank in Japan - 250+ ; rank in Tokyo supply area - 100+

Date of Construction: Unknown; in operation as early as Dec 1926 and as recently as Dec 1936

Details: Particular capacities (in kw) - 3500 supp
Plant, equipment -
Boilers - 2 @ Garbe-type, 225 lbs/in^2, 3020 ft^2, EW-make
2 @ Garbe-type, 225 lbs/in^2, 1620 ft^2, EW-make
Turbines - 1 @ 3350 hp, EW-make
1 @ 1400 hp, W-make
Generators - 1 @ 3200 kva, 3-ph, 3300 v, 3000 rpm, 50 cyc, SS-make
1 @ 1250 kva, 3-ph, 3300 v, 3000 rpm, 50 cyc, W-make
Transformers - 3 @ 1000 kva, 1-ph, 3.3/44,42,40 kv, D-D conn, self-cooled, 50 cyc, core-type, Okumura-make
3 @ 500 kva, 1-ph, 3.3/44,42,40 kv, D-D conn, self-cooled, 50 cyc, core-type, Okumura-make

Sources: DnK; DJY 1927; DJY 1929 p.332; TD Map

26. AKITA KARYOKU STEAM PLANT Approx. Lat. 39°42'
Long. 140°06'30"

Company: Dai Nippon Denryoku KK; formerly Hokkaido Dento KK

Location: Kawaguchi-sakai, Kawashiro-cho, Akita-shi, Akita-ken

Installed Capacity (in kw): 1785, as of June 1928

Importance: Rank in Japan - 250+ ; rank in Tohoku supply area - 20+

Date of Construction: Completed Feb 1928; in operation Mar 1940

Details: Particular capacities (in kw) - 1785 supp
Plant, equipment -
Boilers - 1 @ Garbe-type, 230 lbs/in^2, 350° C, 175 m^2, SB-make
Turbines - 1 @ 2800 hp, BBC-make
Generators - 1 @ 2100 kva, 3-ph, 3300 v, 300 rpm, 50 cyc, BBC-make

Sources: DnN 1940; Ohm 5/28 p.301; DJY 1929 pp.290,404

27. AMAGASAKI STEAM PLANT

Approx. Lat. 34°42'
Long. 135°24'30"

Company: Nippon Hassoden KK; formerly Nippon Denryoku KK

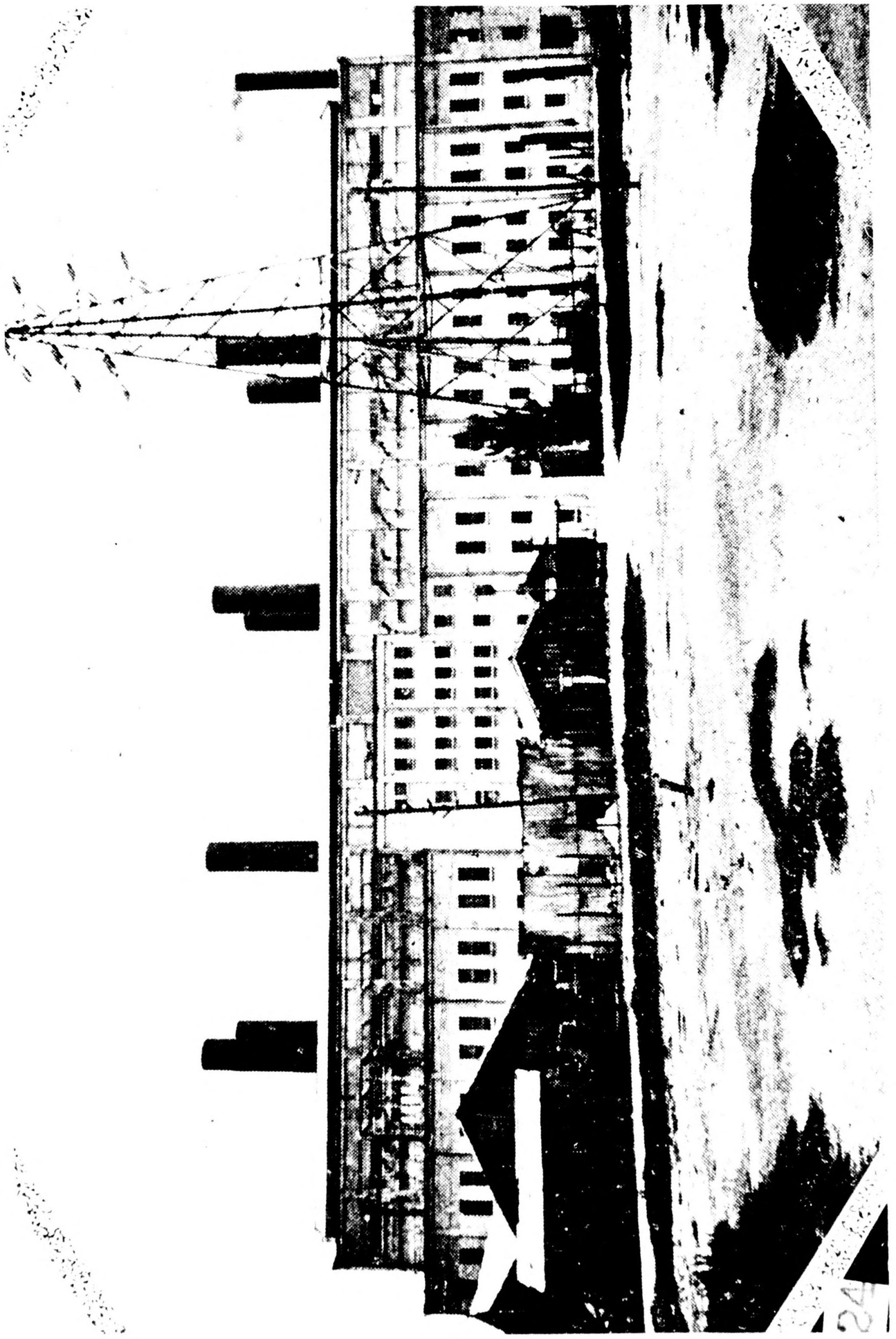
Location: On west bank of Shoge-kawa, at 3, 4-wari, Higashihama-cho, Osu-ku, Amagasaki-shi, Hyogo-ken, about a mile east of Amagasaki No. 1 Steam Plant

Installed Capacity (in kw): 140,000, as of Dec 1936

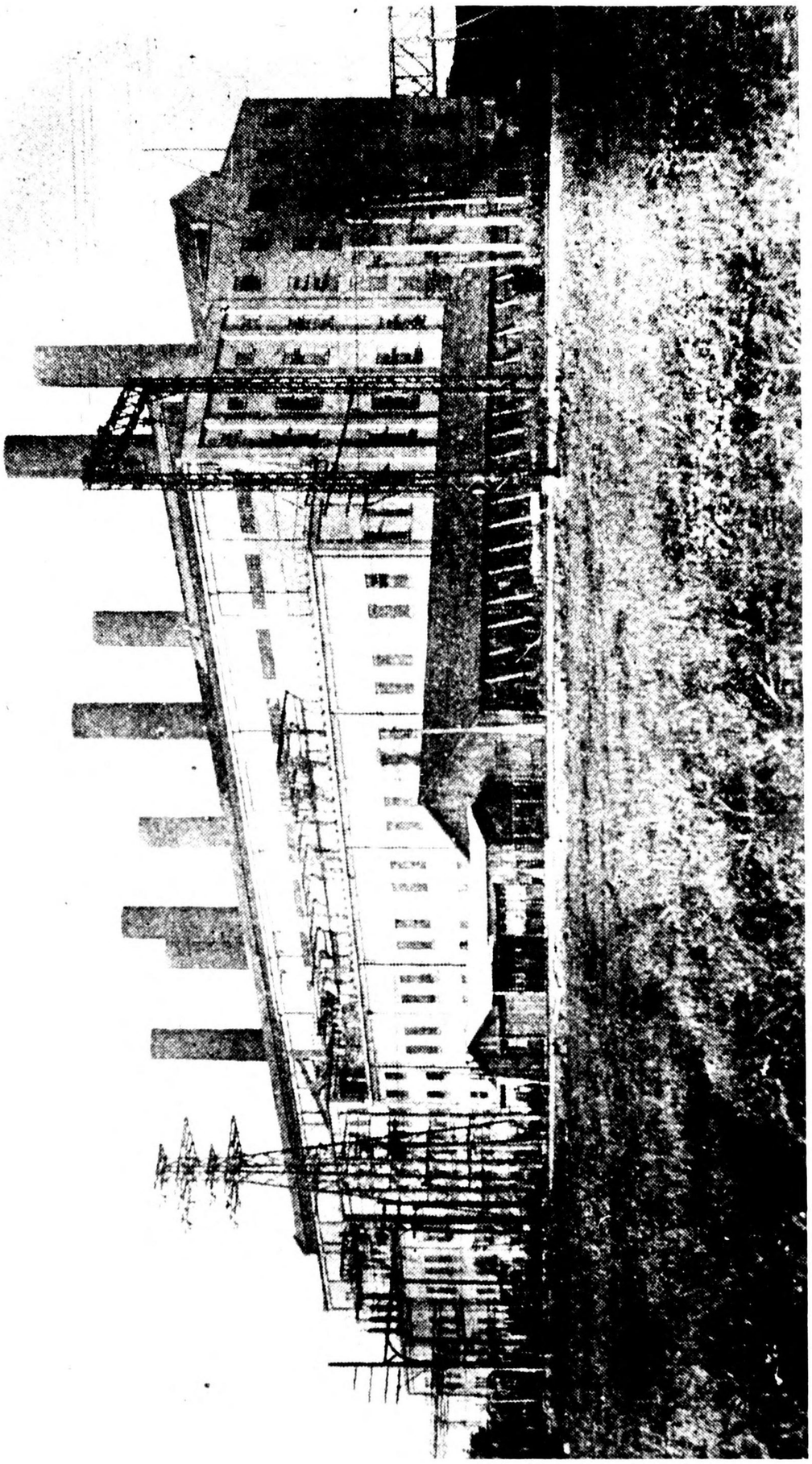
Importance: Rank in Japan - 10 ; rank in Osaka-Nagoya supply area - 5
Together with Amagasaki Nos. 1 and 2 Fuel Plants, supplies 60% of the steam power of the Osaka area

Date of Construction: Plant was constructed in sections: 2 units @ 25,000 kw installed in 1924, 2 other units @ 25,000 kw installed in 1927, and 1 unit @ 40,000 kw installed in 1928. Plant in operation Mar 1940

Details: Particular capacities (in kw) - 20,000 reg; 120,000 supp
Plant, external features - Of steel and reinforced concrete, 6 stories high, about 200 x 75 ft, with 8 chimneys. Several one- and two-story wooden houses are located on the grounds.
Plant, equipment -
Fuel supply - Coal is supplied from 2 docks by 2 skip-hoists and at least 2 belt conveyors, each with a cap of 40 tons per hr. Coal is stored in an outdoor yard.
Feedwater - Supplied by the Shoge-kawa directly to plant from intakes on north and south ends of plant. Water contains 3 g of salt and 0.5 g of alkali per million g of water.
Boilers - 8 @ CTM-type, 290 lbs/in^2, 10,821 ft^2, B&W-make
4 @ CTM-type, 290 lbs/in^2, 13,467 ft^2, B&W-make
4 @ CTM-type, 290 lbs/in^2, 13,467 ft^2, B&W-make
Turbines - 1 @ 55,000 hp, impulse tandem-type, horizontal-shaft, MV-make
2 @ 35,000 hp, horizontal-shaft, MV-make
2 @ 35,000 hp, horizontal-shaft, EW-make
Generators - 1 @ 40,000 kw, 3-ph, 11,000 v, 1800 rpm, 60 cyc, MV-make
2 @ 25,000 kw, 3-ph, 11,000 v, 1800 rpm, 60 cyc, MV-make
2 @ 25,000 kw, 3-ph, 11,000 v, 1800 rpm, 60 cyc, Shibaura-make
Transformers - 12 @ 8333 kva, 1-ph, D-Y conn, water-cooled, 60 cyc, Hitachi-make
1 @ 14,583 kva, 1-ph, D-Y conn, water-cooled, 60 cyc, EW-make



Photograph No. II-9 Amagasaki Steam Plant of the
Nippon Denryoku KK in 1927



Photograph No. II-10 Amagasaki Steam Plant of the
Nippon Denryoku KK in 1938

Photograph No. II-11 Amagasaki Steam Plant
of the Nippon Denryoku KK

Other equipment - 16 economizers, 5 condensers, 5 exciters (incl 2 @ 110 kw, 2 @ 115 kw, 1 @ 240 kw); 16 furnaces (incl 4 @ 8000 ft^3 with underfeed stokers, 4 @ 12,000 ft^3 with pulverized coal feed, and 8 @ 10,000 ft^3 with underfeed stokers); 16 superheaters (incl 4 @ 4900 ft^2, 634° F, 4 @ 6220 ft^2, 634° F, and 8 @ 2757 ft^2, 634° F)
Area served - Kansai, Gifu and Nagoya districts in 1933

See: Photographs No. II-9, II-10, II-11
Map of the City of Amagasaki

Sources: Ohm 11/27 p.499, 12/28 p.623, 5/27 p.208, 2/27 p.78, 12/27 front cover, 6/31 supp pp.7,9, 1927 pp.418,504, 9/34 p.650; DnGZ 9/31 p.564; DnN 1940; DnK; DJY 1927; DJY 1929 p.342; ZKT 1939 p.1644; Ohm-sha Guide 1933 p.31

28. AMAGASAKI NO. 1 STEAM PLANT

Approx. Lat. 34°41'30"
Long. 135°22'45"

Company: Nippon Hassoden KK; formerly Kansai Kyodo Karyoku KK

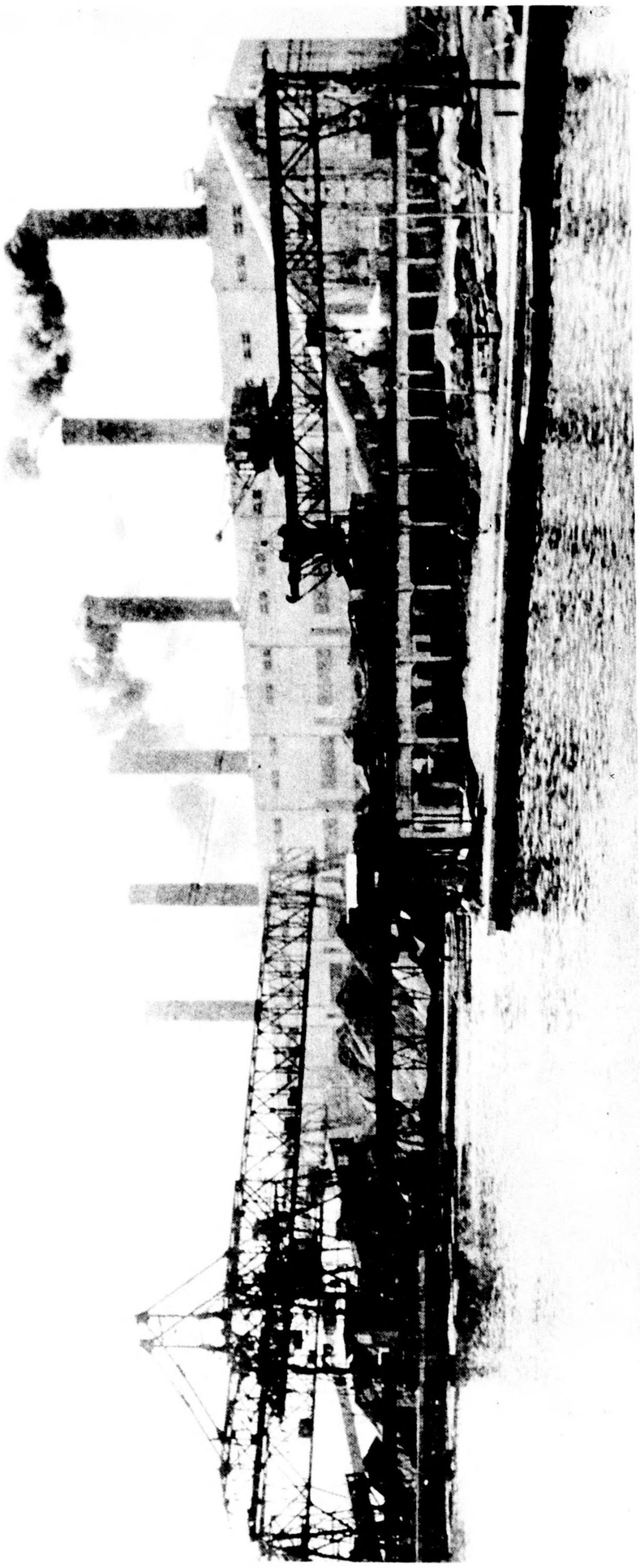
Location: On the publicly-owned reclaimed land on the waterfront east of the Muko-gawa on the outskirts of Amagasaki-shi, in 1-chome, Suehiro-cho, Ojo-mura, Muko-gun, Hyogo-ken. This plant is about 400 yards from Amagasaki No. 2, and about 1 mile west of Amagasaki Steam Plant.

Installed Capacity (in kw): 318,000, as of May 1938

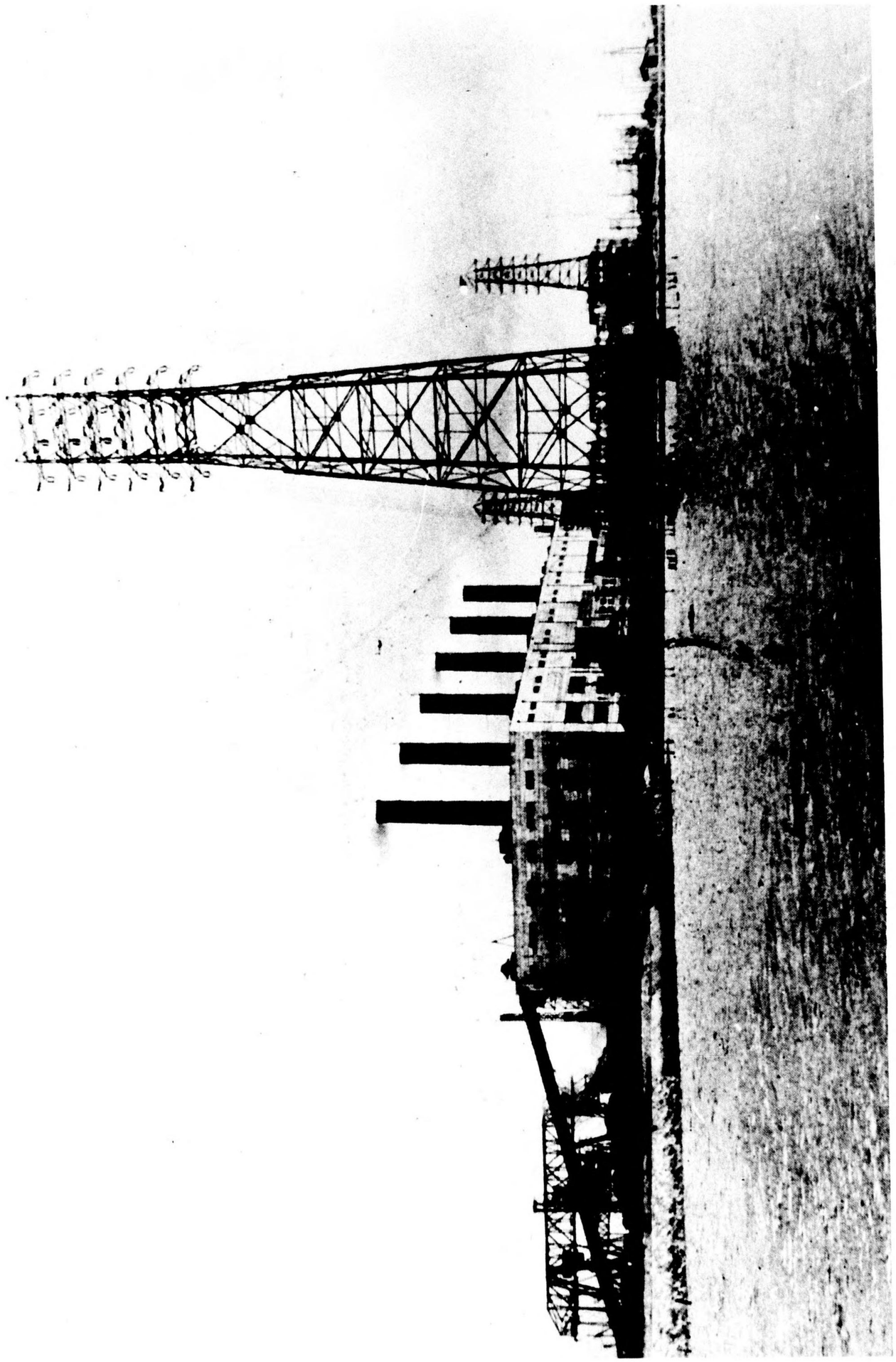
Importance: Rank in Japan - 2 ; rank in Osaka-Nagoya supply area - 2 -
This plant, together with Amagasaki No. 2 Steam Plant, supplies 50% of the steam power of the Osaka area.

Date of Construction: The plant was constructed in sections, with units of 53,000 kw being put into operation as follows: No. 1 late in 1933, No. 2 in Feb 1934, No. 3 in Dec 1934, No. 4 and No. 5 in Dec 1935, and No. 6 at the end of 1936.

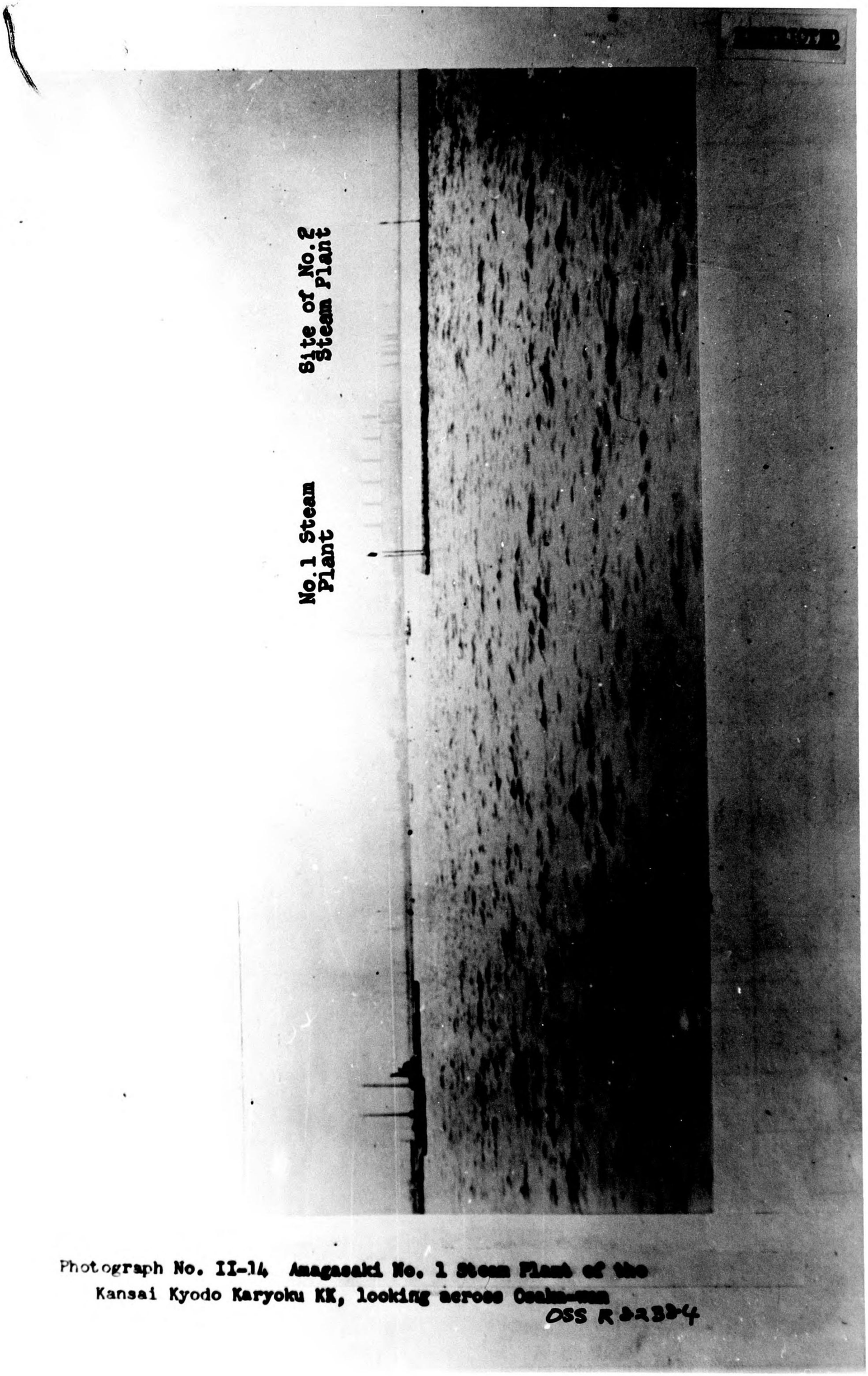
Details: Plant, external features - Of reinforced concrete construction with steel frame, 5 stories, 28.8 m high with 6 chimneys 31 m above roof level in one line. Three tall steel-frame transmission towers, 1 offshore, are located alongside the plant.
Plant, equipment -
Fuel supply - Coal supply ships up to 7000 tons displacement can tie up alongside the sea-wall in 9 m depths. Two skip-hoists with a cap of 250 tons per hr transport coal to storage yard of 100,000 tons cap. Two belt conveyors carry coal from yard to plant and 1 additional conveyor carries coal to auxiliary storage yard.
Feedwater - 2 intakes from nearby canal are connected directly to plant; inside plant are 3 water-head tanks with a total cap of 200 tons for each of the 6 units
Boilers - 6 @ Mitsubishi-make
6 @ B&W-make
Turbines - 3 @ 53,000 kw, Zoelly-type, tandem-impulse, horizontal-shaft, 4 bleeder-stages, Mitsubishi-make
2 @ 53,000 kw, horizontal-shaft, Shibaura-make
1 @ 53,000 kw, horizontal-shaft, MV-make



Photograph No. II-12 Amagasaki No. 1 Steam Plant of the Kansai Kyodo Karyoku KK in 1934 from the coal yard side

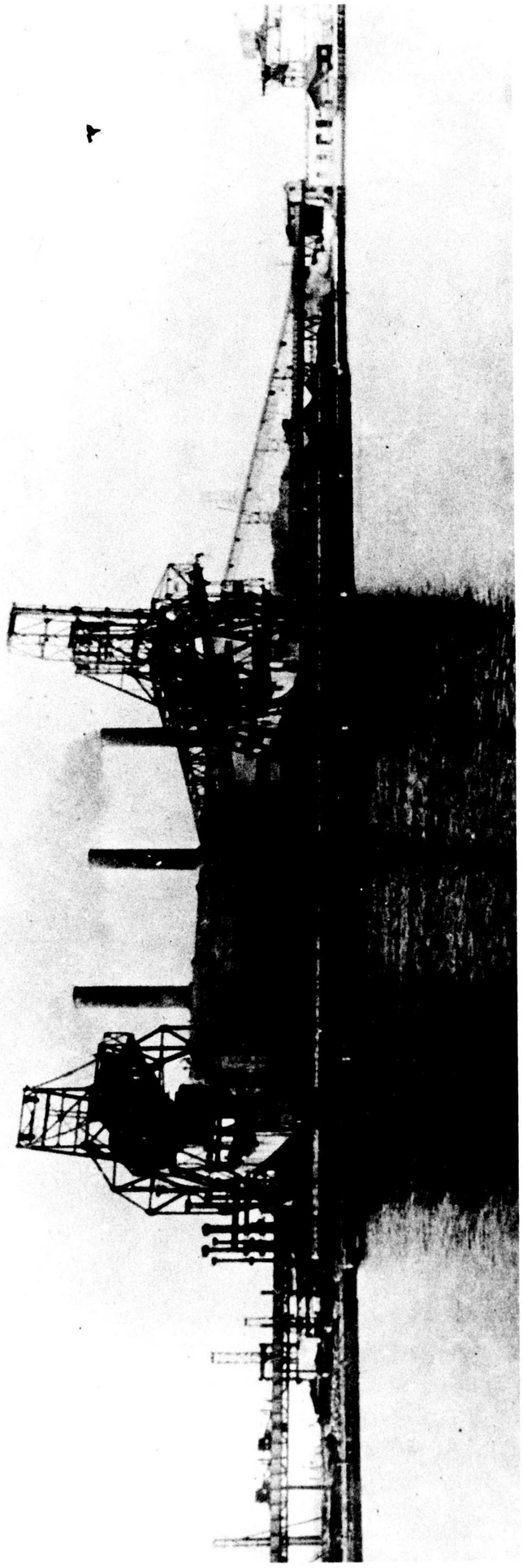


Photograph No. II-13 Amagasaki No. 1 Steam Plant of the Kansai Kyodo Karyoku KK in 1936 from the switch gear side



Photograph No. II-14 Amagasaki No. 1 Steam Plant of the Kansai Kyodo Karyoku KK, looking across Osaka-wan

OSS R 32334

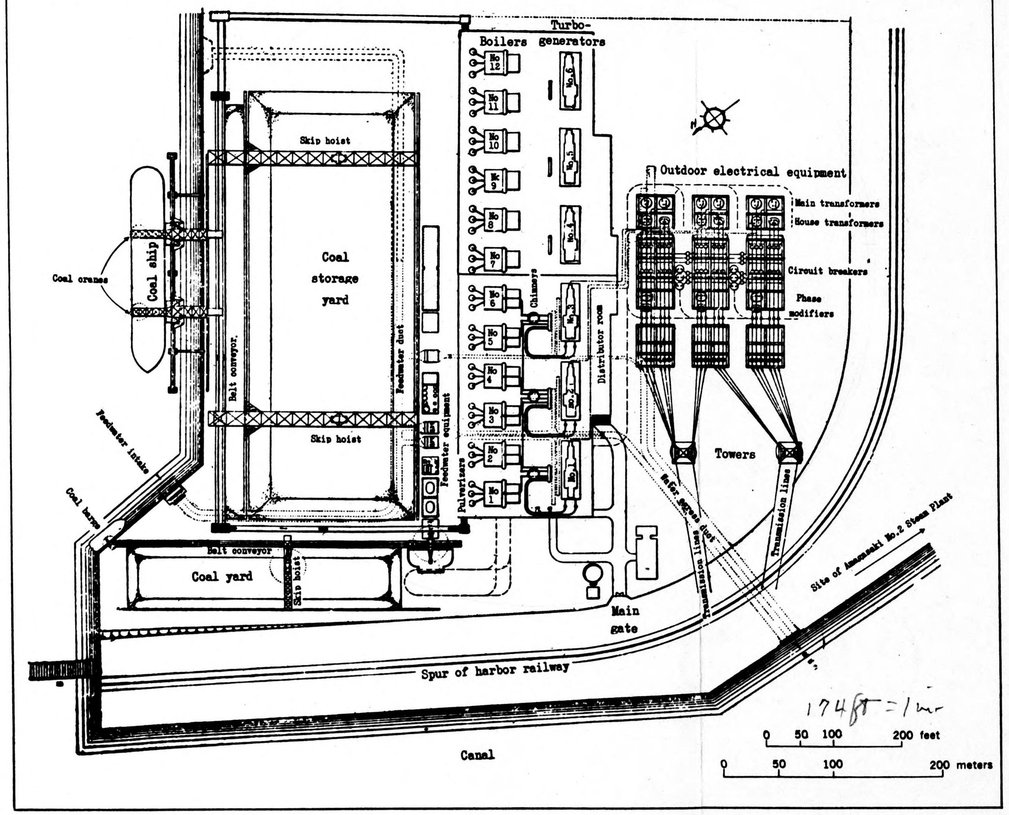


Photograph No. II-15 Amagasaki No. 1 Steam Plant of the Kansai Kyodo Karyoku KK in 1933 from the coal yard side

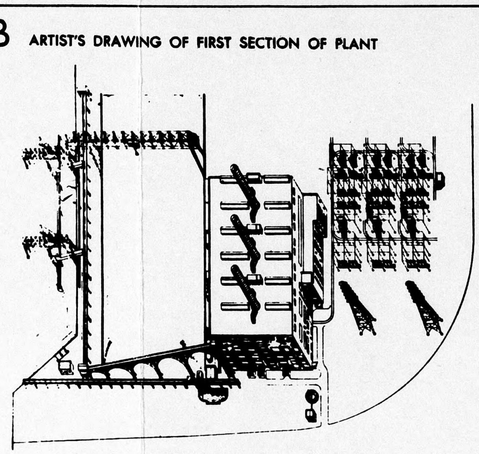
Photograph No. II-16 Amagasaki Steam Plants of the Kansai Kyodo Karyoku KK in 1939. No. 1 is at the left and No. 2 at the right.

AMAGASAKI NO.1 STEAM PLANT

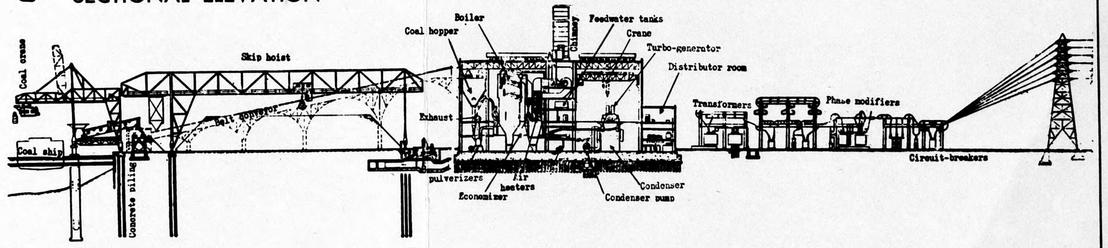
A GROUND PLAN



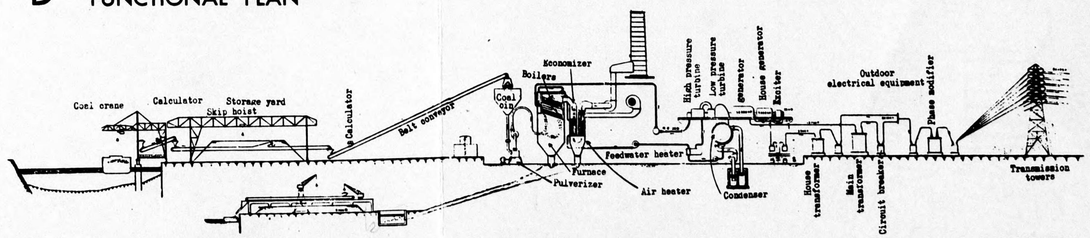
B ARTIST'S DRAWING OF FIRST SECTION OF PLANT



C SECTIONAL ELEVATION



D FUNCTIONAL PLAN



NO. 2401
19 JULY 1943

R. & A., OSS
LITHOGRAPHED, OSS

Generators - 3 @ 62,500 kva, 3-ph, 13,200 v, 1800 rpm, 60 cyc, Mitsubishi-make
3 @ 62,500 kva, 3-ph, 13,200 v, 1800 rpm, 60 cyc, Shibaura-make
Other equipment - It is believed pulverized coal feed is used throughout. At least 6 pulverizers are used.
An 85 kv cable with a cap of 100,000 kva connects this plant to Amagasaki No. 2 Steam Plant.
Area served - Kinki region with Osaka as center

See: Photographs No. II-12, II-13, II-14, II-15, II-16
Figure No. II-4, II-4a
Map of the City of Amagasaki

Sources: Ohm 1/36 pp.2,6,7, 8/33 front cover, 3/34 p.202, 2/36 p.212; DnGZ 3/38 pp.42,(146),(147), 5/38 p.68 adv; DnK; DnN 1940; SR 9/34 p.315, 11/34 p.449; Shin Nippon Daikan p.30; AA p.22

29. AMAGASAKI NO. 2 STEAM PLANT — Approx. Lat. 34°41'30" Long. 135°22'45"

Company: Nippon Hassoden KK; formerly Kansai Kyodo Karyoku KK

Location: On the publicly-owned reclaimed land on the waterfront east of the Muko-gawa on the outskirts of Amagasaki-shi, at 5, 1-chome, Suehiro-cho, Ojo-mura, Muko-gun, Hyogo-ken. This plant is 400 yards from Amagasaki No. 1, and about 1 mile west of Amagasaki Steam Plant.

Installed Capacity (in kw): 375,000, as of Nov 1940. (An unconfirmed report indicates possible expansion since, by addition of one 75,000 kw unit. This would bring capacity of plant to 450,000.)

Importance: Rank in Japan - 1; rank in Osaka-Nagoya supply area - 1

Date of Construction: Construction begun in Dec 1936 and completed in sections, with units of 75,000 kw being put into operation as follows: No. 1 in Dec 1937; No. 2 in Nov 1938; No. 3 in Jan 1939; No. 4 in early 1940; No. 5 in Fall 1940.

Details: Plant, external features - Constructed of steel frame, reinforced concrete, 3 stories high, with 4 smoke stacks, as of June 1940
Plant, equipment -
Fuel supply - Coal freighters up to 9000 tons displacement may tie up at the dock in about 9 m depths. At least 2 skip-hoists lead to outdoor coal yard. At least 1 conveyor belt leads from coal yard to inside the plant.
Feedwater - Water is probably taken directly from the nearby canal.
Boilers - At least 4 @ Hitachi-make, and 6 @ 200 lbs steam per hr, B&W-make
Turbines - 3 (units No. 2,3,4) @ 75,000 kw (60,000 kw eco cap), horizontal-shaft, Shibaura-make
2 (units No. 1,5) @ 75,000 kw (60,000 kw eco cap), horizontal-shaft, Mitsubishi-make
Generators - 3 (units No. 2,3,4) @ 93,750 kva, 80% pf, 3-ph, 13,200 v, 1800 rpm, 60 cyc, Shibaura-make
2 (units No. 1,5) @ 93,750 kva, 80% pf, 3-ph, 13,200 v, 1800 rpm, 60 cyc, Mitsubishi-make

Other equipment - 5 exciters @ 250 kw. Pulverized coal firing is used throughout.
An 85 kv cable with a cap of 100,000 kva connects this plant to Amagasaki No. 1 Steam Plant.
Area served - Kinki region with Osaka as the center

See: Photograph No. II-16
Map of the City of Amagasaki

Sources: Ohm 3/37 p.308, 12/37 p.1455, 3/38 p.321, 12/38 pp.1246,1264, 1266, 11/38 p.1157; DnGZ 10/37 p.(143), 11/37 p.(207), 3/38 p.42, 11/40 adv p.3; SR 1/39 pp.2,3, 3/39 pp.2,89,99, 1/38 pp.3,10, 6/39 p.236, 11/40 p.2, 7/39 adv, 1/41 p.2, 11/38 p.1157; DnN 1940

30. AMAGASAKI FACTORY STEAM PLANT — Approx. Lat. 34°42' Long. 135°25'

Company: Osaka Soda KK

Location: On the east bank of the Shoge-kawa at 11, Otakasu-cho, Amagasaki-shi, Hyogo-ken

Installed Capacity (in kw): 3300 (see Date of Construction)

Importance: Rank in Japan - 250+ ; rank in Osaka supply area - 100+
Serves the soda factory of the Osaka Soda KK

Date of Construction: Under construction Sept 1937; probably completed since

See: Map of the City of Amagasaki

Sources: DnGZ 10/37 p.(143); ZKT 1939 p.1030

AMAGASAKI HIGASHI STEAM PLANT - See AMAGASAKI STEAM PLANT

31. AMBOGAWA NOS. 1, 2, 3 HYDRO PLANTS — Approx. Lat. 30°20' Long. 130°35'

Company: Kagoshima-ken in 1938; it was intended at that time to transfer the plant later to a private company.

Location: On Yaku-shima, in Shimo Yaku-mura, Kumage-gun, Kagoshima-ken

Capacity Commonly in Use (in kw): 3 plants totaling 54,811 (see Date of Construction)

Importance: Rank in Japan - 33 ; rank in Kyushu supply area - 7
These plants were intended to supply power for the manufacture of aluminum, magnesium, molybdenum, tungsten, caustic soda, and the refining of low-phosphorus pig iron, in plants to be set up on Yaku-shima. About 50,000 tons of aluminum were to be produced annually.

Capacity Commonly in Use (in kw): 6600, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Hokkaido supply area - 15+

Source of Power: Ishikari-kawa

Date of Construction: Completed Jan 1927; in operation Mar 1940

Details: Particular capacities (in kw) - *9411 installed cap; 3700 reg; 2900 spec
Eff head - 455 m; flow - 17.8 m^3/sec
Plant, equipment -
Turbines - 2 @ 7400 hp, Francis-type, vertical-shaft, Dengyosha-make
Generators - 2 @ 5882 kva, 3-ph, 6600 v, 300 rpm, 50 cyc, Shibaura-make
Transformers - 4 (incl 1 res) @ 3850 kva, 1-ph, 6.6/66, 67.5,69 kv, D-D conn, water-cooled, 50 cyc, core-type, Shibaura-make
Other equipment - 2 exciters @ 65 kw
Area served - Ishikari and Teshio regions, as of 1933

Sources: DnN 1940; Ohm 3/28 p.180, 6/31 supp p.6; SR 6/28 p.194; ZKT 1939 p.1652; DnK; DJY 1929 pp.292,406; Ohm-sha Guide 1933 p.26

34. AOBARA HYDRO PLANT — Approx. Lat. 36°15' Long. 138°10'

Company: Shinshu Denki KK; formerly Suwa Denki KK

Location: Plant - Wada-mura, Chiisagata-gun, Nagano-ken

Capacity Commonly in Use (in kw): 1600, as of June 1928

Importance: Rank in Japan - 250+; rank in Tokyo supply area - 100+

Source of Power: Yoda-gawa of the Shinano-gawa system

Date of Construction: Unknown; in operation as early as Dec 1926 and as recently as Mar 1940

Details: Particular capacities (in kw) - *1600 installed cap; 800 reg; 800 spec
Eff head - 272 ft
Plant, equipment -
Turbines - 2 @ 1300 hp, Francis-type, Hitachi-make
Generators - 2 @ 1000 kva, 3-ph, 3300 v, 750 rpm, 50 cyc, Hitachi-make
Transformers - 4 (incl 1 res) @ 900 kva, 1-ph, 3.3/25,22 kv, D-D conn, water-cooled, 50 cyc, core-type

Sources: DnN 1940; DJY 1927; DJY 1929 p.328; TD Map

35. AOMIGAWA HYDRO PLANT

Company: Denki Kagaku Kogyo KK

Location: Plant - Believed to be located either at Aomigawa-oaza, Yonekawa-mura, Nakakubiki-gun, or at Aomi-machi, Nishi Kubiki-gun, both in Niigata-ken

Capacity Commonly in Use (in kw): 3300 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Tohoku supply area - 20+

Source of Power: Probably Aomi-gawa

Date of Construction: Under construction Sept 1938; probably completed since

Details: Particular capacities (in kw) - *3200 installed cap
Plant, equipment -
Turbines - 1 @ unknown cap
Generators - 1 @ 4000 kva, 3-ph, 11,000 v, 720 rpm, 60 cyc

Sources: SR 1/39 p.5; ZKT 1939; KN 1939 p.166; DHJ vol 1, p.76

36. ARAKAWA HYDRO PLANT — Approx. Lat. 37°43'30" Long. 140°21'45"

Company: Arakawa Denryoku KK

Location: Plant - 21, Nishi Teshiromori-aza, Sahara-oaza, Sakura-mura, Shinobu-gun, Fukushima-ken

Capacity Commonly in Use (in kw): 3050 (see Date of Construction)

Importance: Rank in Japan - 250+ ; rank in Tohoku supply area - 20+

Source of Power: Shio-kawa and Ara-kawa of the Abukuma-kawa system

Date of Construction: Completed in late 1938 or early 1939; in operation July 1941

Details: Particular capacities (in kw) - 1850 reg; 1200 spec

Sources: DnN 1940; Ohm 8/37 p.902; KN 1939 p.166

37. ARAKAWA HYDRO PLANT — Approx. Lat. 38°05'30" Long. 139°34'45"

Company: Murakami Suiden KK

Location: Plant - Kaiwaki-aza, Yuzawa-oaza, Onnagawa-mura, Iwafune-gun, Niigata-ken

Capacity Commonly in Use (in kw): 2130, as of Dec 1936

Importance: Rank in Japan - 250+ ; rank in Tokyo supply area - 20+

Source of Power: Ara-kawa

Date of Construction: Completed July 1927; in operation Mar 1940

Details: Particular capacities (in kw) - *2000 installed cap; 850 reg; 1280 spec
Eff head - 33.9 ft
Plant, equipment -
Turbines - 2 @ 1860 hp, Francis-type, Hitachi-make
Generators - 2 @ 1250 kva, 3-ph, 3300 v, 166.7 rpm, 50 cyc, Hitachi-make
Transformers - 3 @ 800 kva, 1-ph, 3.3,3.15,3.0/33,31.5,30 kv, D-D conn, self-cooled, 50 cyc, shell-type, Hitachi-make

Sources: DnN 1940; Ohm 11/27 p.499; ZKT 1939 p.1648; DJY 1929 pp.283, 388; DnK

38. ARAKAWA HYDRO PLANT — Approx. Lat. 35°22' Long. 135°56'15"

Company: Kyoto Dento KK

Location: Plant - 1100, Mukaiwa-aza, Arakawa-oaza, Kuzuki-mura, Takashima-gun, Shiga-ken

Capacity Commonly in Use (in kw): 2000, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Miki-gawa and Azumi-kawa of the Biwa-ko system

Date of Construction: Founded Sept 1921; in operation Mar 1940

Details: Particular capacities (in kw) - *2000 installed cap; 2000 reg
Plant, equipment -
Turbines - 2 @ 1840 hp, Francis-type, Okumura-make
Generators - 2 @ 1250 kva, 3-ph, 3500 v, 450 rpm, 60 cyc, Okumura-make
Transformers - 4 (incl 1 res) @ 800 kva, 1-ph, 3.5/33 kv, D-D conn, water-cooled, 60 cyc, core-type, W-make
4 (incl 1 res) @ 500 kva, 1-ph, 3.5/16.5,15.7,15 kv, D-D conn, water-cooled, 60 cyc, shell-type, Okumura-make

Sources: DnN 1940; DnK; DJY 1927; DJY 1929 p.342; ZKT 1939 p.1645; TD Map

39. ARAKAWA STEAM PLANT — Approx. Lat. 35°45' Long. 139°46'

Company: Tokyo-Yamate Kyuko Denki Tetsudo KK

Location: Arakida-oaza, Mikawajima-cho, Arakawa-ku, Tokyo-shi, Tokyo-fu

Installed Capacity (in kw): 6000 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Tokyo supply area - 100+

Date of Construction: Construction was begun Oct 1928; the plant has probably been completed since.

See: Map of the City of Tokyo

Sources: Ohm 1/29 p.78

40. ARANOGIKAWA HYDRO PLANT Approx. Lat. 37°33'30" Long. 137°38'

Company: Chubu Godo Denki KK; formerly Kiso Denki KK

Location: Plant - 92516, Shimodaira-oaza, Azuma-mura, Nishi Tsukuma-gun, Nagano-ken

Capacity Commonly in Use (in kw): 1200, as of June 1928

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Aranogi-kawa of the Kiso-kawa system

Date of Construction: Completed Oct 1925; in operation Mar 1940

Details: Particular capacities (in kw) - *1280 installed cap; 725 reg; 475 spec
Layout - Aqueduct-type
Eff head - 183.6 ft
Plant, equipment -
Turbines - 2 @ 1080 hp, Francis-type, vertical-shaft, EW-make
Generators - 2 @ 800 kva, 3-ph, 3500 v, 720 rpm, 60 cyc, SS-make
Transformers - 4 (incl 1 res) @ 500 kva, 1-ph, 3.45,3.3/11 kv, D-D conn, self-cooled, 60 cyc, shell-type, Yasukawa-make

Sources: DnN 1940; ZKT 1939 p.1646; DJY 1927; DJY 1929 p.324

41. ARASHI HYDRO PLANT Approx. Lat. 35°22'15" Long. 139°02'15"

Company: Fuji Denryoku KK

Location: Plant - Yufure-oaza, Shimizu-mura, Ashigarakami-gun, Kanagawa-ken

Capacity Commonly in Use (in kw): 4300, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Tokyo supply area - 100+

Source of Power: Kawachi-gawa of the Sakemagari-gawa

Date of Construction: Founded Aug 1920; in operation Mar 1940

Details: Particular capacities (in kw) - 6800 installed cap; 2340 reg; 1060 spec
Eff head - 285 ft
Plant, equipment -
Turbines - 1 @ 4500 hp, Francis-type, Dengyosha-make
1 @ 3000 hp, Francis-type, EW-make

Generators - 1 @ 2500 kw, 3-ph, 6600 v, 500 rpm, 50 cyc,
Shibaura-make
1 @ 1800 kw, 3-ph, 6600 v, 500 rpm, 50 cyc,
Shibaura-make
1 @ 2500 kw, 3-ph, 6600 v, 500 rpm, 50 cyc,
Dengyosha-make

Sources: DnN 1940; ZKT 1939 p.1644; Ohm 6/32 p.343; DnK; DJY 1927; DJY 1929 p.306; TD Map

ARATA HYDRO PLANT - See KATSUYAMA HYDRO PLANT

42. ARIMINE HYDRO PLANT

Approx. Lat. 36°28'
Long. 137°26'

Company: Toyama-ken

Location: Plant - 27-wari, Arimine-chi, Oyama-mura, Kami Niikawa-gun, Toyama-ken

Capacity Commonly in Use (in kw): 3600, as of Sept 1938 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area - 100+

Source of Power: Ma-gawa of the Joganji-kawa system

Date of Construction: Construction was begun in May 1936; still under construction in Mar 1940. Believed to have been completed since.

Details: Particular capacities (in kw) - 690 reg
Layout - Aqueduct-type
This plant operates on 60 cyc

Sources: DnN 1940; Ohm 8/36 p.805; KN 1939 p.166; DnGZ 7/37, 9/37 p.(139); DGS 4/37 p.111

ARIMINE DAM HYDRO PLANT - See WADAGAWA HYDRO PLANT

ASAFU HYDRO PLANT - See KAMI ASO HYDRO PLANT

43. ASAHI HYDRO PLANT

Approx. Lat. 35°14'30"
Long. 137°26'

Company: Nippon Hassoden KK; formerly Omi Denryoku KK

Location: Plant - Ushiji-oaza, Asahi-mura, Higashi Kamo-gun, Aichi-ken

Capacity Commonly in Use (in kw): 1105, as of Dec 1934

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Danto-kawa of the Yahagi-gawa system

Date of Construction: Unknown: in operation as early as Dec 1936 and as recently as Mar 1940

Details: Particular capacities (in kw) - *1160 installed cap; 635 reg; 470 spec
Plant - equipment -
Turbines - 1 @ 2600 hp, Francis-type, vertical-shaft, Okumura-make
Generators - 1 @ 1450 kva, 3-ph, 6600 v, 6600 rpm, 60 cyc, Okumura-make

Sources: DnN 1940; DJY 1927; DJY 1929 p.320

44. ASAHI HYDRO PLANT Approx. Lat. 35°19' Long. 133°26'30"

Company: Hiroshima Denki KK; formerly Sanin Denki KK

Location: Plant - 858 Sho-oaza, Mizuguchi-machi, Hino-gun, Tottori-ken

Capacity Commonly in Use (in kw): 2000, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Chugoku supply area - 25+

Source of Power: Hino-kawa

Date of Construction: Unknown; in operation as early as Dec 1926 and as recently as Mar 1940

Details: Particular capacities (in kw) - *2000 installed cap; 1000 reg; 1000 spec
Eff head - 81 ft
Plant, equipment -
Generators - 2 @ 1250 kva, 3-ph, 2200 v, 450 rpm, 60 cyc, Shibaura-make
Transformers - 4 (incl 1 res) @ 835 kva, 1-ph, 2.2/22 kv, D-D conn, water-cooled, 60 cyc, shell-type, Hitachi-make

Sources: DnN 1940; ZKT 1939 p.1649; DnK; DJY 1927; DJY 1929 p.360

45. ASAHI HYDRO PLANT Approx. Lat. 38°17' Long. 140°07'15"

Company: Yamagata Denki KK

Location: Plant - Tokiwa-oaza, Nishi Imokawa-mura, Nishi Murayama-gun, Yamagata-ken

Capacity Commonly in Use (in kw): 1260, as of Dec 1934

Importance: Rank in Japan - 250+; rank in Tohoku supply area - 20+

Source of Power: Asahi-gawa of the Mogami-kawa system

Date of Construction: Founded Jan 24; in operation Mar 1940

Details: Particular capacities (in kw) - *1120 installed cap; 830 reg; 430 spec
Eff head - 177.2 ft
Plant, equipment -
Turbines - 2 @ 950 hp, Francis-type, Voith-make
Generators - 2 @ 700 kva, 3-ph, 3450 v, 514 rpm, 60 cyc, Shibaura-make
Transformers - 3 @ 500 kva, 1-ph, 3.45,3.419,3.387,3.356/26,13 kv, D-D conn, water-cooled, core-type, Shibaura-make

Sources: DnN 1940; ZKT 1939 p.1649; DJY 1927; DJY 1929 p.400

ASAHI KENSHOKU FACTORY STEAM PLANT

Company: Asahi Kenshoku KK

Location: Unknown

Installed Capacity (in kw): About 7000, as of 1932

Importance: Rank in Japan - 250+
Serves Asahi spinning mill

Date of Construction: Turbines installed about Nov 1932

Details: Plant, equipment -
Turbines - 2 @ 3500 kw, Mitsubishi-make
Generators - 2 @ unknown cap, 3-ph

Sources: Ohm 1/33 adv p.16

47. ASAKA HYDRO PLANT

Approx. Lat. 35°06'30"
Long. 134°34'

Company: Hyogo-ken

Location: Plant - 754, 755, 756 Kami Kakiuchi-aza, Asaka-oaza, Kamube-mura, Shiso-gun, Hyogo-ken

Capacity Commonly in Use (in kw): 5030 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Mikata-kawa and Hikihara-kawa of the Iho-kawa system

Date of Construction: Construction was begun in Aug 1935 and one section of 2640 kw was completed Apr 1939. Remainder is believed to have been completed thereafter; in operation Mar 1940

Details: Particular capacities (in kw) - 1450 reg; 3580 spec
Layout - Aqueduct-type

Sources: DnN 1940; KN 1938 p.199; KN 1939 p.166; Ohm 7/39 p.694, 11/35 p.1030; DnGZ 9/37 p.(139); DGS 4/37 p.111

ASAO HYDRO PLANT - See KAMI ASO HYDRO PLANT

48. ASHIGATA HYDRO PLANT

Approx. Lat. 35°20'
Long. 138°35'

Company: Tokyo Dento KK

Location: Plant - Utsuno-aza, Shitaito-mura, Fuji-gun, Shizuoka-ken

Capacity Commonly in Use (in kw): 1744, as of May 1936

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Shiba-kawa of the Fuji-kawa system

Date of Construction: Completed in Feb 1918; in operation Mar 1940

Details: Particular capacities (in kw) - *1800 installed cap; 1315 reg; 429 spec
Layout - Aqueduct-type
Eff head - 31.88 m; flow - 7.4 m^3/sec
Dam - 21.66 m long, 4.85 m high, of concrete construction
Aqueduct - 932 m open channel
Forebay - 159 m^2 water surface
Penstock - 1 @ 78.5 m long
Plant, external features - Of wood, 1 story high
Plant, equipment -
Turbines - 1 @ 2600 hp, Francis-type, horizontal-shaft
Generators - 1 @ 2250 kva, 80% pf, 3-ph, 3450 v, 450 rpm, 60 cyc, GE-make

Sources: DnN 1940; DJY 1927; DJY 1929 p.300

49. ASHIYASU HYDRO PLANT

Approx. Lat. 35°40'
Long. 138°20'

Company: Kyosai Denryoku KK

Location: Plant -28, Yasudori-oaza, Ashiyasu-mura, Nakakoma-gun, Yamanashi-ken

Capacity Commonly in Use (in kw): 1200, as of Dec 1934

Importance: Rank in Japan - 250+ ; rank in Tokyo supply area - 100+

Source of Power: Kanayama-zawa and the branches of the Gochokushi-kawa system

Date of Construction: Construction was begun in Oct 1927 and completed June 1930; in operation Mar 1940

Details: Particular capacities (in kw) - 700 reg; 500 spec
This plant operates on 50 cyc

Sources: DnN 1940; ZKT 1939 p.1647; Ohm 9/30 p.463, 1/28 p.80

50. ASHIZU HYDRO PLANT

Approx. Lat. 35°17'15"
Long. 134°18'45"

Company: Nippon Denryoku KK; formerly Sanyo Suiryoku Denki KK

Location: 743, Kishinokami-aza, Ashizu-oaza, Chizu-machi, Yazu-gun, Tottori-ken

Capacity Commonly in Use (in kw): 2700 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Chugoku supply area - 25+

Source of Power: Kitamata-kawa of the Sendai-kawa system

Date of Construction: Construction was begun Sept 1935 and completed about Sept 1937; in operation Aug 1941

Details: Particular capacities (in kw) - 900 reg; 1800 spec
Layout - Aqueduct-type
Eff head - 200 m; flow - 1.67 m^3/sec
Dam - 25 m high, 88.25 m long, 29.94 m thick at base

Sources: DnN 1940; DGS Kaimu 1937 p.103, 4/37 p.111; DnGZ 9/37 p.(139); Ohm 12/35 p.1219; ZKT 1939 p.1649; HSG pp.164-165

ASO HYDRO PLANT - See KAMI ASO HYDRO PLANT

51. ASUKE HYDRO PLANT

Approx. Lat. 35°08' N
Long. 137°19' E

Company: Toho Denryoku KK; formerly Chubu Denryoku KK, Okazaki Dento KK

Location: Plant - 10, Iwakiyomizu-aza, Asuke-oaza, Asuke-machi, Higashi Kamo-gun, Aichi-ken

Capacity Commonly in Use (in kw): 1565, as of Dec 1934

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Tomoe-gawa of the Yahagi-gawa system

Date of Construction: Founded Sept 1919; in operation Mar 1940

Details: Particular capacities (in kw) - *1600 installed cap; 1095 reg; 470 spec
Eff head - 245 ft

Plant, equipment -
Turbines - 1 @ 3000 hp, reaction-type, EW-make
Generators - 1 @ 2000 kva, 3-ph, 3000 v, 600 rpm, 50 cyc, W-make
Transformers - 4 (incl 1 res) @ 700 kva, 1-ph, 3/34.5 kv, D-D conn, water-cooled, 50 cyc, shell-type, Okumura-make
This plant does not appear to be tied in with the Osaka-Nagoya network.

Sources: DnN 1940; ZKT 1939 p.1644; Ohm 5/32 p.291; DJY 1927; DJY 1929 p.318

52. ASURI HYDRO PLANT — Approx. Lat. 35°10' Long. 137°16'

Company: Toho Denryoku KK; formerly Chubu Denryoku KK

Location: Plant - 1 of 16, Choshi-aza, Okawara-oaza, Asuri-mura, Higashi Kamo-gun, Aichi-ken
Dam - Asuri-mura, Higashi Kamo-gun, Aichi-ken

Capacity Commonly in Use (in kw): 4000, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Main course of the Yahagi-gawa

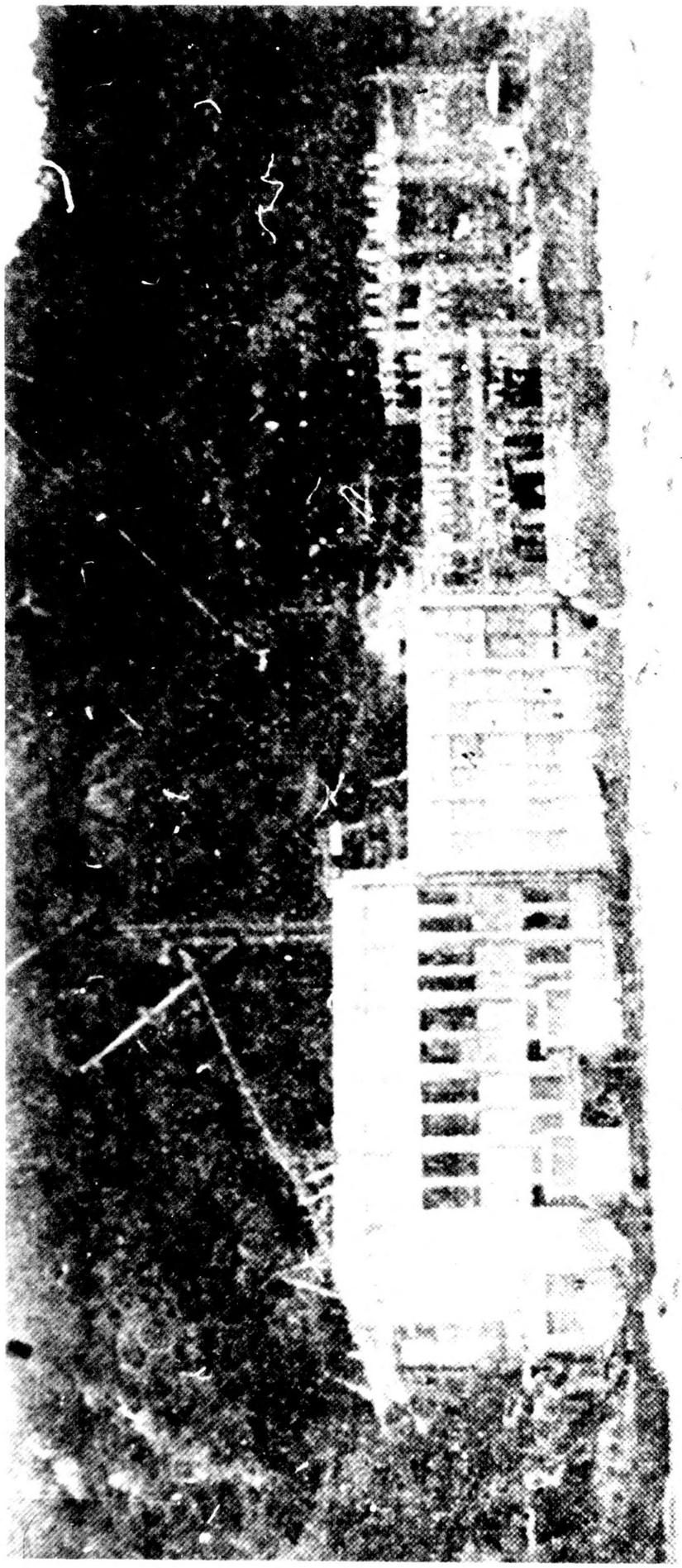
Date of Construction: Construction was begun in May 1933 and completed Nov 1934; in operation Mar 1940

Details: Particular capacities (in kw) - 4000 installed cap; 1350 reg; 2650 spec
Layout - Aqueduct-type
Eff head - 49 ft; flow - 1300 ft^3/sec
Dam - 248 ft long at top, 35 ft above deepest part of foundation, with 8 stony gates at 23 x 33 ft
Intake - 3 gates @ 15 ft wide, 15 ft deep; of reinforced concrete construction
Aqueduct - Pressure tunnel, 630 ft long
Surge tank - Cylindrical, with 50 ft inner diam, 36 ft high, of concrete construction with 2 trapgates
Penstocks - 2 @ 246 ft long
Log chute - 442 ft long, 7.5 ft wide, 4 ft deep; of reinforced concrete construction
Fishway - 601 ft long, 12 ft wide, 7.5 ft deep; of reinforced concrete construction
Plant, external features - Of reinforced concrete construction, 43 ft high
Plant, equipment -
Turbines - 2 @ 3250 hp, Kaplan propeller-type, Dengyosha-make
Generators - 2 @ 2500 kva, 80% pf, 3-ph, 3300 v, 300 rpm, 60 cyc, Shibaura-make
Transformers - 4 @ 1700 kva
Other equipment - 1 crane @ 30-ton cap
Tail race - 2 concrete draft tubes emptying into 2 aqueducts 8 ft long, 21.45 ft wide, 14.73 ft deep, of concrete construction

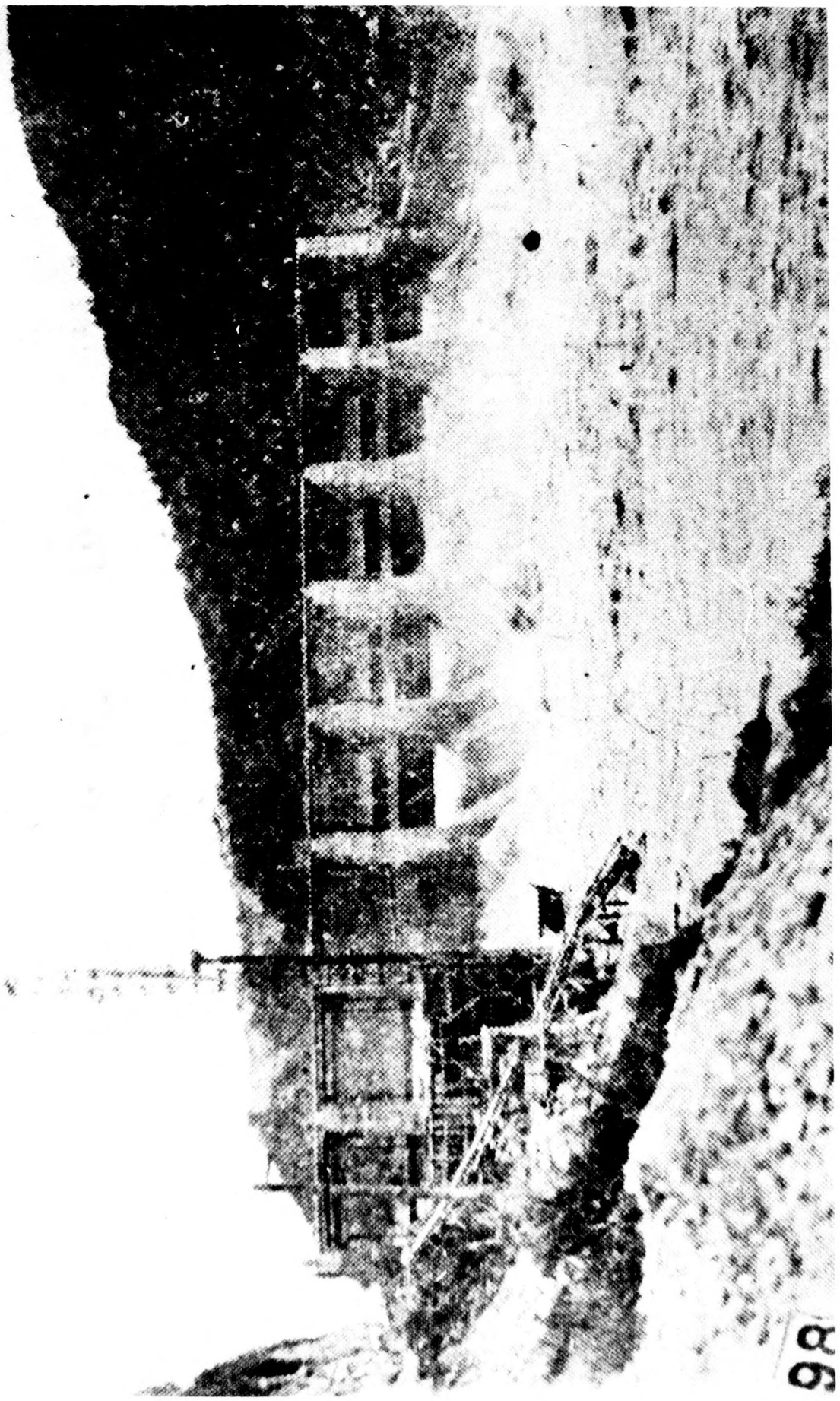
See: Photographs No. II-17, II-18

Sources: DnN 1940; ZKT 1939 p.1644; Ohm 1/34 pp.3,14, 4/35 p.389; DGS 2/35 p.316; DnK

By _____ NARA, Date _____



Photograph No. II-17 Asuri Hydro Plant in 1935



Photograph No. II-18 Asuri Hydro Plant dam in 1935

ATAEGAWA HYDRO PLANT - See YOGAWA HYDRO PLANT

ATARUMA HYDRO PLANT - See ANTAROMA HYDRO PLANT

53. ATOTSU HYDRO PLANT — Approx. Lat. 36°24'30" Long. 137°19'

Company: Kamioka Suiden KK

Location: Plant - 581, Atotsugawa-oaza, Funazu-machi, Yoshiki-gun, Gifu-ken

Capacity Commonly in Use (in kw): 6850, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area -100+

Source of Power: Atotsu-kawa of the Takahara-gawa system

Date of Construction: Founded Dec 1924; in operation Mar 1940

Sources: DnN 1940; ZKT 1939 p.1645; DnK

54. ATSUTA HYDRO PLANT — Approx. Lat. 36°32'30" Long. 138°47'30"

Company: Tokyo Dento KK

Location: Plant - 615, Arai-aza, Atsuta-oaza, Iwashima-mura, Azuma-gun, Gumma-ken

Capacity Commonly in Use (in kw): 1000, as of May 1936

Importance: Rank in Japan - 250+; rank in Tokyo supply area -100+

Source of Power: Otanizawa-gawa and Yu-kawa of the Tone-gawa system

Date of Construction: Completed Oct 1914; in operation Mar 1940

Details: Particular capacities (in kw) - 1200 installed cap; 1000 reg
Layout - Aqueduct-type with regulating reservoir
Eff head - 82.4 m; flow - 1.95 m^3/sec
Dams - 1 - 22.4 m long, 10 m high, of concrete with stone pitching
2 - 19.7 m long, 5.4 m high, of concrete with stone pitching
Aqueduct - 1930 m open channel, 1193 m tunnel
Forebay - 79.3 m^2 water surface
Excess water spillway - 400 m long
Penstock - 1 @ 342 m long
Plant, external features - Of wood, 1 story high with 5 other smaller wooden one-story buildings nearby
Plant, equipment -
Turbines - 2 @ 1050 hp, Francis-type, horizontal-shaft, Voith-make

Generators - 2 @ 750 kva, 80% pf, 3-ph, 3300 v, 600 rpm, 50 cyc, Shibaura-make
Transformers - 4 (incl 1 res) @ 600 kva, 1-ph, 3.3/22.1, 13.35,13.0 kv, D-D conn, water-cooled, 50 cyc, shell-type, Shibaura-make
Tail race - 50.3 m long

Sources: DnN 1940; DJY 1927; DJY 1929 p.298

55. ATSUTA KARYOKU STEAM PLANT

Approx. Lat. 35°09'
Long. 136°54'

Company: Toho Denryoku KK

Location: 84, Maruyama, Hanaomote-machi, Atsuta-ku, Nagoya-shi, Aichi-ken

Installed Capacity (in kw): 10,000, as of Dec 1936

Importance: Rank in Japan - 221 ; rank in Osaka-Nagoya supply area - 89

Date of Construction: Completed Oct 1915; in operation Mar 1940

Details: Particular capacities (in kw) - 10,000 supp
Plant, external features - Steel frame, brick walls, wooden and corrugated sheet-iron roof, with 2 stacks and auxiliary buildings and switch-gear on premises
Plant, equipment -
Fuel supply - In 1928 coal was unloaded and delivered to bunkers manually. Hokkaido coal was used in 1928.
Feedwater - City water used at the rate of 690 ft^3/hr; no treatment or purification plant in 1928
Boilers - 6 @ B&W-type, 14.061 kg/cm^2, 574.2 m^2, B&W-make
Turbines - 1 @ 3000 kw, Curtis-type, GE-make
1 @ 3000 kw, Parsons-type, Mitsubishi-make
1 @ 4000 kw, Curtis-type, Mitsubishi-make
Generators - 1 @ 3750 kva, 3-ph, 11,000 v, 1800 rpm, 60 cyc, GE-make
1 @ 3750 kva, 3-ph, 11,000 v, 1800 rpm, 60 cyc, Mitsubishi-make
1 @ 5000 kva, 3-ph, 11,000 v, 3600 rpm, 60 cyc, GE-make
Transformers - 3 @ 100 kva, 3-ph, 11/.22,.11 kv, self-cooled, Hitachi-make
3 @ 120 kva, 3-ph, 11/.22,.11 kv, self-cooled, Hitachi-make
Other equipment - 3 condensers, 8 B&W chain-grate stokers and 4 underfeed stokers, 4 B&W super-heaters, 4 B&W boiler feed pumps, 1 overhead traveling crane @ 20-ton cap, 1 portable oil filter, 1 exciter @ 45 kw, 1 exciter @ 35 kw and 1 exciter @ 25 kw

See: Photograph No. II-19
Map of the City of Nagoya

Sources: DnN 1940; DnK; Ohm 6/31 supp p.6; DJY 1927; DJY 1929 p.318; Ohm-sha Guide 1933 p.55; TD Map

AWAGAWA NOS. 1, 2, 3 HYDRO PLANTS - See AMBOGAWA NOS. 1, 2, 3 HYDRO PLANTS

Photograph No. II-19 Atsuta Steam Plant
of the Toho Denryoku KK in 1928

o. AYUKAWA HYDRO PLANT

Approx. Lat. 33°13'15"
Long. 131°19'30"

Company: Kyushu Suiryoku Denki KK

Location: Plant - Kawanishi-oaza, Minami Yufu-mura, Hayami-gun, Oita-ken

Capacity Commonly in Use (in kw): 1000, as of Dec 1934

Importance: Rank in Japan - 250+; rank in Kyushu supply area - 50+

Source of Power: Oita-kawa

Date of Construction: Unknown; in operation as early as Dec 1926 and as recently as Mar 1940

Details: Particular capacities (in kw) - 1000 installed cap; 1000 reg
Eff head - 160 ft
Plant, equipment -
Turbines - 1 @ 1750 hp, Francis-type, Dengyosha-make
Generators - 1 @ 1000 kw, 3-ph, 3500 v, 600/720 rpm, 50/60 cyc, Shibaura-make

Sources: DnN 1940; DJY 1927; DJY 1929 p.376

AZUMI HYDRO PLANT - See ASAKA HYDRO PLANT

57. AZUSA HYDRO PLANT

Approx. Lat. 36°10'45"
Long. 137°48'15"

Company: Shinshu Denki KK; formerly Suwa Denki KK

Location: Plant - Kawabara-oaza, Azusa-mura, Minami Azumi-gun, Nagano-ken

Capacity Commonly in Use (in kw): 2130 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Tokyo supply area - 100+

Source of Power: Sai-kawa and Kamaga-zawa

Date of Construction: Construction was begun Dec 1929; the plant has probably been completed since.

Details: Particular capacities (in kw) - 770 reg; 1360 spec; 1260 reg pk

Sources: Ohm 3/30 p.166

BADO HYDRO PLANT - See UMAMICHI HYDRO PLANT

58. BONJIKAWA HYDRO PLANT — Approx. Lat. 38°35'30" Long. 139°51'

Company: Higashi Tagawa-gun Denki Kumiai

Location: Plant - 13, 14, Higashi Yama-aza and Nagawa-aza, Kami Nagawa-caza, Hongo-mura, Higashi Tagawa-gun, Yamagata-ken

Capacity Commonly in Use (in kw): 3000, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Tohoku supply area - 20+

Source of Power: Bonji-kawa of the Mogami-kawa

Date of Construction: Construction was begun Oct 1931 and completed Oct 1933; in operation Mar 1940

Details: Particular capacities (in kw) - 1840 reg; 1160 spec
Layout - Believed to be aqueduct-type
Dam - Of concrete construction, gravity, over-flow-type, 34.85 m high above foundation
Plant operates on 60 cyc

Sources: DnN 1940; DnK; ZKT 1939 p.1649; Ohm 1/32 p.65, 1/34 p.71; DGS 8/33 p.674

59. BUNSUI NO. 1 HYDRO PLANT — Approx. Lat. 33°40'15" Long. 133°19'15"

Company: Shikoku Chuo Denryoku KK

Location: Plant - Kiyomizu-mura, Agawa-gun, Kochi-ken

Capacity Commonly in Use (in kw): 8800 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Shikoku supply area - 10

Source of Power: Yoshino-kawa and Omori-kawa

Date of Construction: Construction was begun Mar 1927 and completed after Sept 1938; in operation Oct 1940

Details: Particular capacities (in kw) - 3400 reg; 5400 spec
Layout - Aqueduct-type
Area served - Niihama-shi and environs

Sources: KN 1939 p.166; Ohm 6/37 p.700; DnGZ 9/37 p.(139); Sumitomo-no Jigyo p.83

60. BUNSUI NO. 2 HYDRO PLANT — Approx. Lat. 33°39'45" Long. 133°20'

Company: Shikoku Chuo Denryoku KK

Location: Plant - Kiyomizu-mura, Agawa-gun, Kochi-ken

Capacity Commonly in Use (in kw): 2600 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Shikoku supply area - 15+

Source of Power: Discharge of Bunsui No. 1 Hydro Plant and Eda-kawa of the Niyodo-gawa system

Date of Construction: Construction was begun Mar 1937 and plant was still under construction Oct 1940

Details: Particular capacities (in kw) - 1000 reg; 1600 spec
Layout - Aqueduct-type
Area served - Niihama-shi and environs (according to plans in 1940)

Sources: Ohm 6/37 p.700; Sumitomo-no Jigyo p.83

61. BUNSUI NO. 3 HYDRO PLANT — Approx. Lat. 33°38'15" Long. 133°21'

Company: Shikoku Chuo Denryoku KK

Location: Plant - Kami Yakawa-mura, Agawa-gun, Kochi-ken

Capacity Commonly in Use (in kw): 3200 (see Date of Construction)

Importance: Rank in Japan -250+; rank in Shikoku supply area - 15+

Source of Power: Discharge of Bunsui No. 2 Hydro Plant and Eda-kawa of the Niyodo-gawa system

Date of Construction: Construction was begun Mar 1937 and plant was still under construction Oct 1940

Details: Particular capacities (in kw) - 1200 reg; 2000 spec
Layout - Aqueduct-type
Area served - Niihama-shi and environs (according to plans in 1940)

Sources: Ohm 6/37 p.700; Sumitomo-no Jigyo p.83

62. CHICHIBU CEMENT FACTORY STEAM PLANT — Approx. Lat. 35°59' Long. 139°05'

Company: Chichibu Cement KK

Location: Omiya-oaza, Chichibu-machi, Chichibu-gun, Saitama-ken

Installed Capacity (in kw): 6000, as of Jan 1931

Importance: Rank in Japan - 250+ ; rank in Tokyo supply area - 100 +
Serves Chichibu cement factory

Date of Construction: Completed in late 1929; in operation Mar 1940

Details: Plant, equipment -
Turbines - 1 @ unknown cap, horizontal-shaft
Generators - 1 @ 7500 kva, 80% pf, 3-ph, 3000 rpm, 50 cyc,
Shibaura-make

Sources: DnN 1940; Ohm 1/31 adv p.5; DnGZ 1/31 inside back cover;
SR 8/29 p.264

CHIISAGAMINE HYDRO PLANT - See YAMASATO HYDRO PLANT

63. CHINA HYDRO PLANT — Approx. Lat. 34°59'
Long. 138°05'15"

Company: Tokai Shiryo KK

Location: Plant - China-oaza, Tokuyama-mura, Shida-gun, Shizuoka-ken

Capacity Commonly in Use (in kw): 2250, as of June 1928

Importance: Rank in Japan - 250+ ; rank in Tokyo supply area - 100 +
Serves Tokai paper mill

Source of Power: Oi-kawa

Date of Construction: Unknown; in operation June 1928

Sources: DJY 1929 p.295; TD Map

64. CHITA FACTORY STEAM PLANT — Approx. Lat. 34°53'
Long. 136°56'

Company: Toho Denryoku KK

Location: 33, Yamakata Shinden, Handa-shi, Aichi-ken; probably on
Toya Spinning Mill compound

Installed Capacity (in kw): 1000, as of June 1928

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area -100+

Date of Construction: Unknown; in operation as early as Dec 1926 and as recently as June 1928

Details: Particular capacities (in kw) - 1000 supp
Plant, equipment -
Boilers - 2 @ water-tube-type, 200 lbs/in^2, 4012 ft^2, B&W-make
Turbines - 1 @ 1500 hp, Curtis-type, GE-make
Generators - 1 @ 1250 kva, 1-ph, 650 v, 1800 rpm, 60 cyc, GE-make

Sources: DnN 1940 part II p.300; DJY 1927; DJY 1929 pp.246,318

65. CHITORI HYDRO PLANT

Approx. Lat. 36°43'
Long. 139°13'

Company: Jomo Denryoku KK

Location: Plant - Ikenokami-aza, Hirakawa-oaza, Azuma-mura, Tone-gun, Gumma-ken

Capacity Commonly in Use (in kw): 2140, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +

Source of Power: Katashina-kawa

Date of Construction: Completed Jan 1928; in operation in Mar 1940

Details: Particular capacities (in kw) - *2240 installed cap; 1460 reg; 680 spec; 2140 reg pk
Eff head - 100.9 ft
Plant, equipment -
Turbines - 1 @ 3050 hp, Francis-type, Dengyosha-make
Generators - 1 @ 2800 kva, 3-ph, 6900 v, 300 rpm, 50 cyc, Shibaura-make

Sources: DnN 1940; DnK; Ohm 2/28 p.134, 4/28 p.244, 8/28 p.406; DJY 1929 pp.240,308

66. CHITOSE NO. 1 HYDRO PLANT

Lat. 42°47'15"
Long. 141°26'30"

Company: Oji Seishi KK

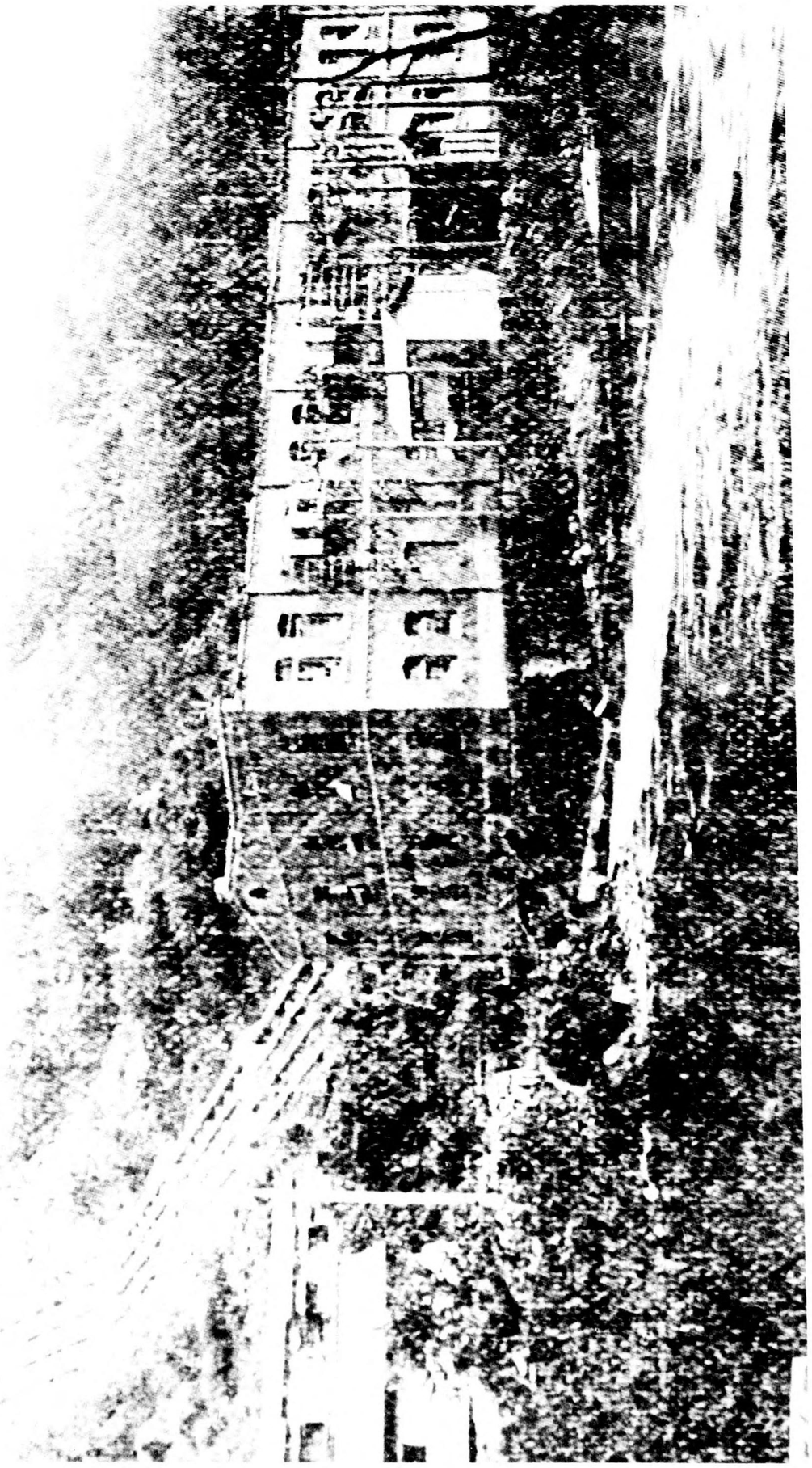
Location: Plant - About 2 miles northeast of Shikotsu-ko in Toritanamai-aza, Chitose-mura, Chitose-gun, Hokkaido; on north bank of Chitose-gawa and just north of the Oji tram line

Capacity Commonly in Use (in kw): 20,000, as of Dec 1936

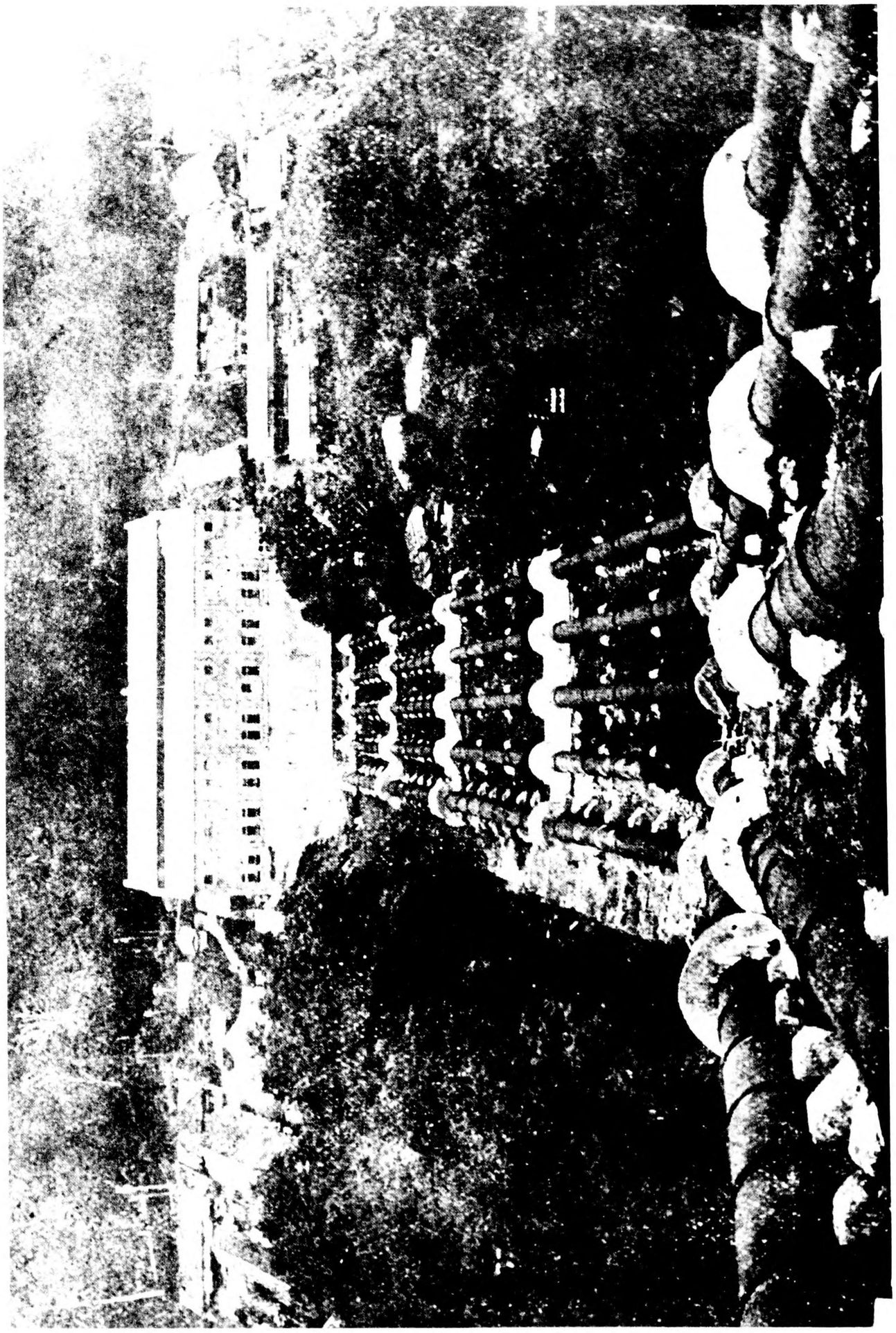
Importance: Rank in Japan - 113 ; rank in Hokkaido supply area - 6

Source of Power: Chitose-gawa and Shikotsu-ko

Date of Construction: Completed Sept 1910; in operation Mar 1940



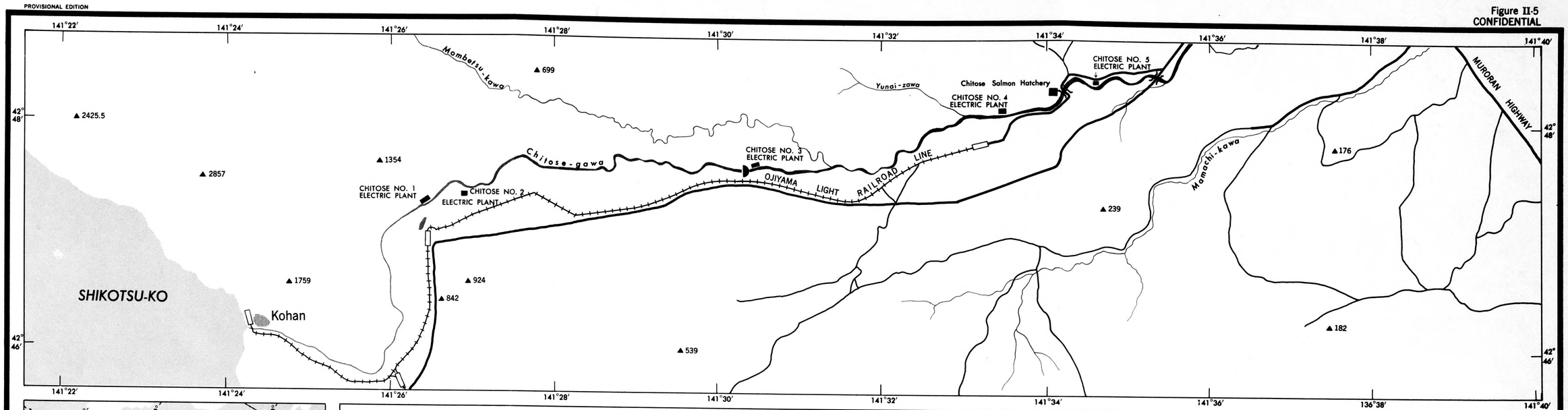
Photograph No. II-20 Chitose No. 1 Hydro Plant before 1930

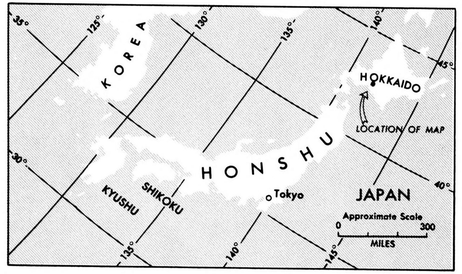


Photograph No. II-21 Chitose No. 1 Hydro Plant in 1931

PROVISIONAL EDITION

Figure II-5
CONFIDENTIAL





CHITOSE-GAWA HYDRO PLANTS
HOKKAIDO

BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1937
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEETS NO. 92-12 AND 92-8.

0 ½ 1 2 3 MILES

0 ½ 1 2 3 KILOMETERS

Reliability Code: 2B--1B--1

- SETTLEMENT
- LIGHT RAILROAD
- STATION
- PRINCIPAL HIGHWAY
- SECONDARY ROAD
- BRIDGE - SELECTED
- ▲2425 SPOT HEIGHT (IN FEET)

MAP NO. 2456
11 OCTOBER 1943

COMPILED AND DRAWN IN THE BRANCH OF RESEARCH AND ANALYSIS, OSS
LITHOGRAPHED IN THE REPRODUCTION BRANCH, OSS

Details: Particular capacities (in kw) - *20,000 installed cap
Layout - Believed to be aqueduct-type
Eff head - 128 m; flow - 16.8 m^3/sec
Dam - Of concrete construction, gravity overflow-type, 3.94 m high
Reservoir - Shikotsu-ko with 185,000,000 m^3 cap
Penstocks - 4 smaller and 1 larger
Plant, external features - 3 stories high with peaked roof; believed to be of brick construction
Plant, equipment -
Turbines - 4 @ 4600 hp, Pelton-type, horizontal-shaft, EW-make
1 @ 7500 hp, Francis-type, horizontal-shaft, Voith-make
1 @ 8000 hp, Francis-type, Dengyosha-make
Generators - 4 @ 3125 kva, 3-ph, 3450 v, 300 rpm, 60 cyc, GE-make
1 @ 6250 kva, 3-ph, 3450 v, 600 rpm, 60 cyc, Shibaura-make
1 @ 6250 kva, 3-ph, 3450 v, 600 rpm, 60 cyc, Shibaura-make
Transformers - 12 @ 1050 kva, 1-ph, 3.45/26.6,26,25.4 kv, D-D conn, water-cooled, 60 cyc, shell-type, GE-make
6 @ 2100 kva, 1-ph, 3.45/26.6,26,25.4 kv, D-Y conn, water-cooled, 60 cyc, core-type, Shibaura-make
3 @ 1050 kva, 1-ph, 3.45/26.6,26,25.4 kv, D-Y conn, water-cooled, 60 cyc, shell-type, Shibaura-make
Other equipment - 6 exciters (incl 1 @ 150 kw)
Area served - Tomokari, Sapporo and Otaru areas, as of 1933

See: Photographs No. II-20, II-21
Figure No. II-5

Sources: DnK; DnN 1940; ZKT 1939 p.1652; DJY 1927; DJY 1929 p.408; Ohm 6/31 supp p.6, 10/33 opp p.561, 1934 p.768, 12/35 p.1161, 9/37 p.914; Ohm-sha Guide 1933 p.12; TD Map; NCT vol 10 p.53

67. CHITOSE NO. 2 HYDRO PLANT

Lat. 42°47'30"
Long. 141°27'00"

Company: Oji Seishi KK

Location: Plant - About 2/5 mile east-northeast of Chitose No. 1 Hydro Plant in Toritanamai-aza, Chitose-mura, Chitose-gun, Hokkaido; on south bank of the Chitose-gawa and just north of the Oji tram line

Capacity Commonly in Use (in kw): 2000, as of Dec 1936

Importance: Rank in Japan - 250+; rank in Hokkaido supply area - 15 +

Source of Power: Discharge of Chitose No. 1 Hydro Plant and Chitose-gawa

Date of Construction: Founded Mar 1916; in operation Mar 1940

Details: Particular capacities (in kw) - *2000 installed cap; 1600 reg; 400 spec
Eff head - 63.5 ft
Plant, equipment -
Turbines - 1 @ 3180 hp, Francis-type, horizontal-shaft, Dengyosha-make
Generators - 1 @ 2500 kva, 3-ph, 3500 v, 225 rpm, 60 cyc, Shibaura-make

See: Figure No. II-5

Sources: DnN 1940; DnK; Ohm 8/28 p.406, 11/35 p.1161, 12/35 p.1216, 9/37 p.914; ZKT 1939 p.1652; DJY 1927; DJY 1929 p.408; TD Map

68. CHITOSE NO. 3 HYDRO PLANT

Lat. 42°47'30"
Long. 141°30'45"

Company: Oji Seishi KK

Location: Plant and dam - About 3½ miles east of Chitose No. 2 Hydro Plant in Toritanamai-aza, Chitose-mura, Chitose-gun, Hokkaido; on north bank of the Chitose-gawa, north of the Oji tram line

Capacity Commonly in Use (in kw): 2500, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Hokkaido supply area - 15 +

Source of Power: Chitose-gawa and discharge of Chitose No. 2 Hydro Plant

Date of Construction: Founded Mar 1918: in operation Mar 1940

Details: Particular capacities (in kw) - *2500 installed cap; 1700 reg; 800 spec
Layout - Dam-type
Eff head - 65 ft
Dam - 23.6 m in height; 112 m in length
Plant, equipment -
Turbines - 1 @ 3530 hp, Francis-type, Dengyosha-make
Generators - 1 @ 3125 kva, 3-ph, 3450 v, 257 rpm, 60 cyc, Shibaura-make
Transformers - 3 @ 1050 kva, 1-ph, 3.45/26.6,26,25.4 kv, D-Y conn, water-cooled, 60 cyc, shell-type, Shibaura-make

See: Photograph No. II-22
Figure No. II-5

Sources: DnN 1940; ZKT 1939 p.1652; DnK; DJY 1927; DJY 1929 p.408; TD Map; DnGZ 7/37

69. CHITOSE NO. 4 HYDRO PLANT

Lat. 42°48'30"
Long. 141°34'00"

Company: Oji Seishi KK

Location: Plant - About 3 miles east of Chitose No. 3 Hydro Plant in Toritanami-aza, Chitose-mura, Chitose-gun, Hokkaido, on the north bank of the Chitose-gawa

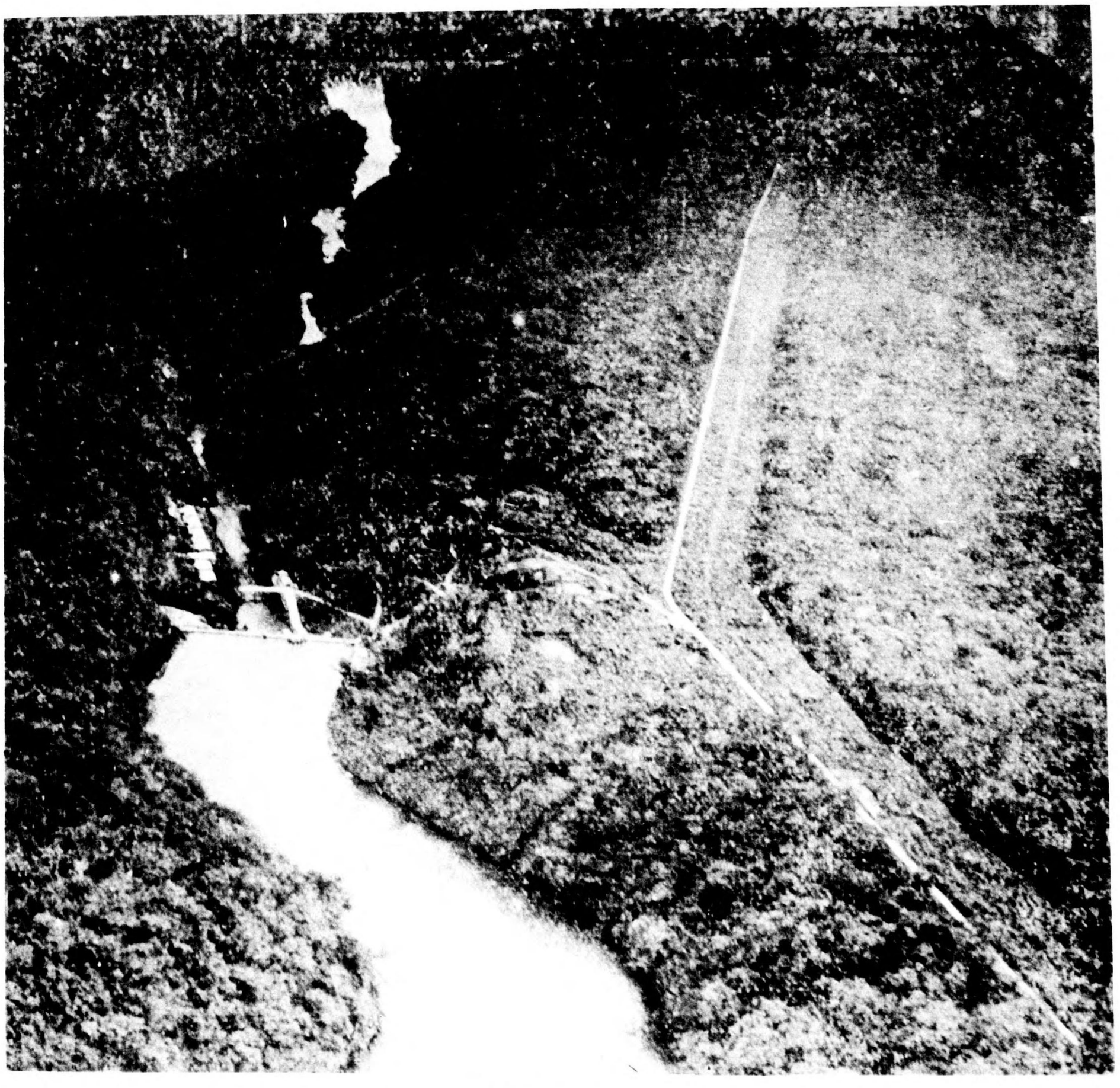
Capacity Commonly in Use (in kw): 2400, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Hokkaido supply area - 15 +

Source of Power: Chitose-gawa and discharge of Chitose No. 3 Hydro Plant

Date of Construction: Unknown; in operation as early as Dec 1926 and as recently as Mar 1940

By _____ NARA Date _____



Photograph No. II-22 Chitose No. 3 Hydro Plant and dam in 1931

Details: Particular capacities (in kw) - *2600 installed cap
Eff head - 57 ft
Dam - 21.9 m high, 102.3 m long
Plant, equipment -
Turbines - 2 @ 1860 hp, Francis-type, Dengyosha-make
Generators - 2 @ 1625 kva, 3-ph, 3300 v, 300 rpm, 60 cyc, Shibaura-make
Transformers - 3 @ 1100 kva, 3-ph, 3.3/26.6,26,25.4 kv, D-Y conn, water-cooled, 60 cyc, shell-type, Shibaura-make

See: Figure No. II-5

Sources: DnN 1940; DnK; Ohm 9/37 p.914; DJY 1927; DJY 1929 p.408; TD Map; DnGZ 7/37

70. CHITOSE NO. 5 HYDRO PLANT — Approx. Lat. 42°48'30" Long. 141°35'

Company: Oji Seishi KK

Location: Plant - Toritanamai-aza, Chitose-mura, Chitose-gun, Hokkaido, downstream from Chitose No. 4 Hydro Plant

Capacity Commonly in Use (in kw): 1000 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Hokkaido supply area - 15 +

Source of Power: Chitose-gawa and discharge of Chitose No. 4 Hydro Plant

Date of Construction: Completed 1939; in operation Jan 1940

Details: Particular capacities (in kw) - *1600 installed cap; 1000 reg; 1600 reg pk
Plant, equipment -
Turbines - 1 @ unknown cap
Generators - 1 @ 2000 kva, 3-ph, 277 rpm, 60 cyc, Shibaura-make

See: Figure No. II-5

Sources: Ohm 10/37 p.1088; SR 1/40 p.4

CHOKANO HYDRO PLANT - See HAJIKANO HYDRO PLANT

71. CHORYU NO. 2 HYDRO PLANT — Approx. Lat. 42°34'30" Long. 140°54'30"

Company: Muroran Dento KK; formerly Hokkaido Tanko Kisen KK

Location: Plant - Porotu Kohan-aza, Sobetsu-mura, Usu-gun, Hokkaido
Intake - At the ferry station at Naka Kubonai-oaza, Sobetsu-mura, Usu-gun, Hokkaido

Capacity Commonly in Use (in kw): 5475, as of 1939

Importance: Rank in Japan - 250 +; rank in Hokkaido supply area - 15 +

Date of Construction: Construction was begun Aug 1927 and completed in 1939; in operation Mar 1940

Details: Particular capacities (in kw) - 6000 installed cap; 1411 reg; 4064 spec
Layout - Aqueduct-type
Eff head - 43.03 m; flow - 16.7 m^3/sec
Dam - Of concrete construction, 5.15 m high, 39.4 m long at top
Aqueduct - 4211.65 m long
Forebay - 4.25-5.4 m high, 33.31 m wide
Penstocks - 2
Plant, equipment -
Turbines - 2 @ 3300 kw, Francis-type, vertical-shaft, Hitachi-make
Generators - 2 @ 3750 kva, 80% pf, 3-ph, 3300 v, 375 rpm, 50 cyc, Hitachi-make
Tail race - Discharges into Doya-ko

Sources: DnN 1940; DGS 11/37 p.1313; DnGZ 9/37 p.(139); Ohm 11/37 p.1187; HH 1/39 pp.5,10, 1/40 p.6

CHUJO HYDRO PLANT - See NAKAJO HYDRO PLANT

72. CHUO STEAM PLANT — Approx. Lat. 33°00' Long. 129°34'

Company: Kyushu Tanko Kisen KK

Location: Sakito-machi, Nishisonoki-gun, Nagasaki-ken

Installed Capacity (in kw): 6000 (see Date of Construction)

Importance: Rank in Japan -250 +; rank in Kyushu supply area - 50

Date of Construction: 3000 kw capacity had been completed sometime before Jan 1933; an additional 3000 kw was under construction in Sept 1937 and has probably been completed since. Plant in operation Mar 1940

Details: Plant operates on 60 cyc

Sources: DnN 1940; Ohm 1/33 p.44; DnK; DnGZ 10/37 p.(143); ZKT 1939

CHUO STEAM (YAMAGUCHI-KEN) - See TOKUYAMA STEAM PLANT

DAI-GO HYDRO PLANT - See KAGOSHIMA DENKI NO. 5 HYDRO PLANT

DAI-ICHI HYDRO PLANT (TOYAMA-KEN) - See NIPPON TAKUGYO NO. 1 HYDRO PLANT

DAI-JUHACHI HIGASHI HYDRO PLANT - See YATSUKA NO. 1 HYDRO PLANT

DAIMON STEAM PLANT - See KOKURA NO. 1 STEAM PLANT

DAI-NI HYDRO PLANT - See NIPPON TAKUGYO NO. 2 HYDRO PLANT

DAI-SHI HYDRO PLANT - See KAGOSHIMA DENKI NO. 4 HYDRO PLANT

73. DEAI HYDRO PLANT — Approx. Lat. 33°58' Long. 133°46'30"

Company: Shikoku Suiryoku Denki KK

Location: Plant - Otegawa-aza, Otoshi-oaza, Minawa-mura, Miyoshi-gun, Tokushima-ken

Capacity Commonly in Use (in kw): 8815, as of Mar 1932

Importance: Rank in Japan - 250 ; rank in Shikoku supply area - 9

Source of Power: Iya-kawa and its branch, Matsuo-kawa, both of the Yoshino-gawa system

Date of Construction: Construction was begun Apr 1925 and completed Sept 1926; in operation Mar 1940

Details: Particular capacities (in kw) - 10,020 installed cap; 3932 reg; 4883 spec
Layout - Aqueduct-type
Eff head - 123 m; flow - 7.5 m^3/sec
Penstocks - 3
Plant, equipment -
Turbines - 3 @ 3020 kw, Francis-type, vertical-shaft, Dengyosha-make
Generators - 3 @ 3040 kw, 3-ph, 6600 v, 600 rpm, 60 cyc, Shibaura-make
Transformers - 3 (incl 1 res) @ 6000 kva, 1-ph, 66/6.6 kv, V-V conn, water-cooled, 60 cyc, core-type, Shibaura-make
Area served - Transmits to Takamatsu-shi via a 66-kv line

See: Photograph No. II-23

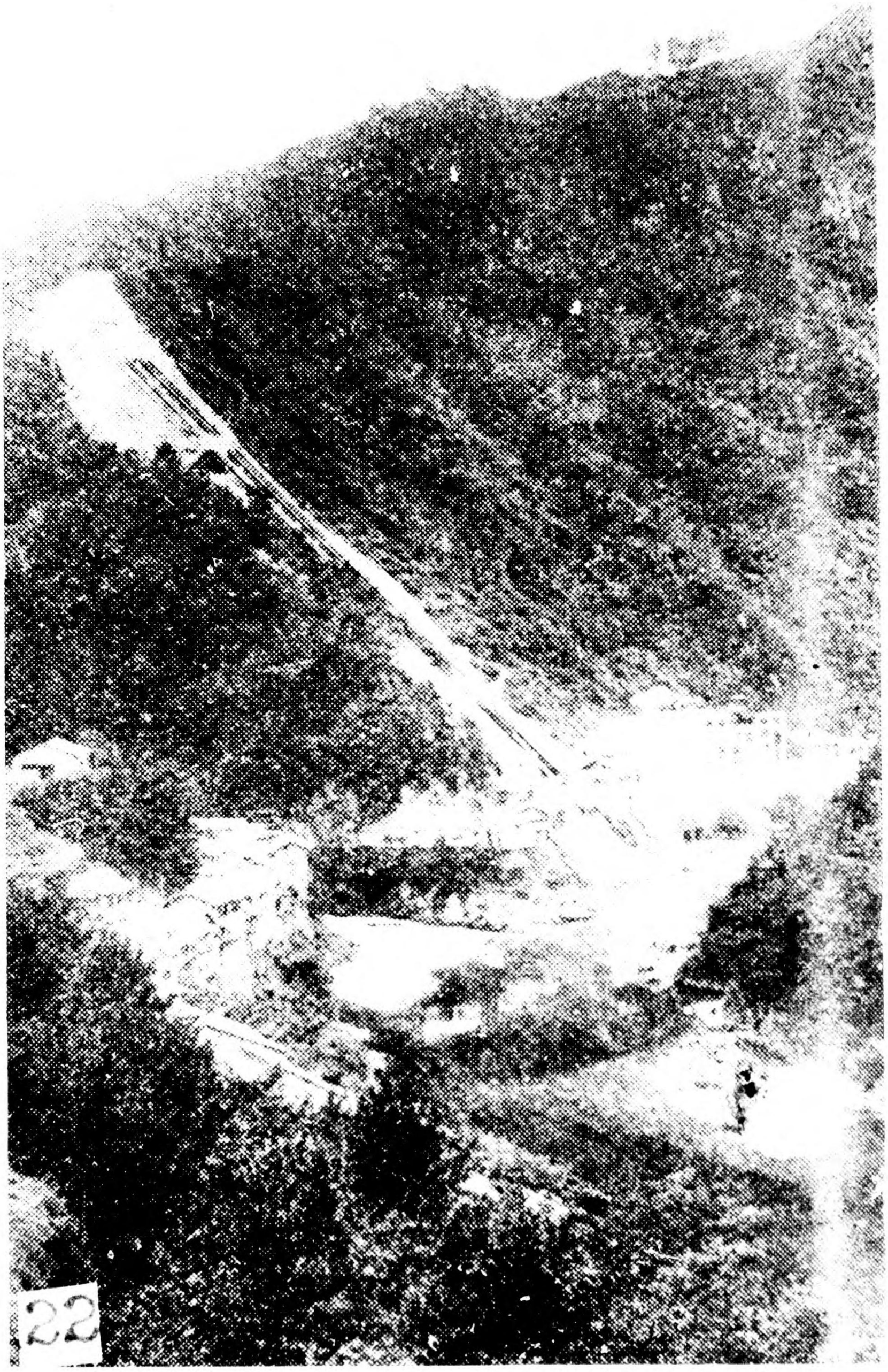
Sources: DnN 1940; DnK; Ohm 5/27 p.236, 11/29 p.558, 6/32 p.343, 6/31 supp p.7; ZKT 1939 p.1650; DJY 1929 pp.272,366

74. DENKO HYDRO PLANT — Approx. Lat. 35°41' Long. 137°42'

Company: Kiso Hatsuden KK; formerly Inagawa Denryoku KK

Location: Plant - 2 of 154, Nagano-oaza, Okuwa-mura, Nishi Tsukuma-gun, Nagano-ken

Capacity Commonly in Use (in kw): 2125, as of Dec 1936



Photograph No. II-23 Deai Hydro Plant in 1927

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area - 100+

Source of Power: Ina-gawa of the Kiso-gawa system

Date of Construction: Founded Dec 1924; in operation Dec 1938

Details: Particular capacities (in kw) - 2000 installed cap; 1215 reg; 910 spec
Layout - Aqueduct-type
Eff head - 108.79 m; flow - 2.146 m^3/sec
Penstocks - 1
Plant, equipment -
Turbines - 1 @ 3000 hp, Francis-type, Dengyosha-make
Generators - 1 @ 2500 kva, 3-ph, 7400 v, 720 rpm, 60 cyc, Shibaura-make

Sources: DGS 1935 p.1287; Ohm 12/29 p.608; DnK; ZKT 1939 p.1646; DJY 1929 pp.255,332

75. DOI HYDRO PLANT

Approx. Lat. 34°38'30"
Long. 132°18'00"

Company: Hiroshima Denki KK

Location: Plant - On the right bank of Ota-kawa at 1 of 116, Kawamuko-aza, Nohara-oaza, Togawachi-machi, Yamagata-gun, Hiroshima-ken
Dam - Yoshiwa-aza, Nohara-oaza, Togawachi-mura, Yamagata-ken, Hiroshima-ken

Capacity Commonly in Use (in kw): 8000, as of Sept 1938

Importance: Rank in Japan - 250+; rank in Chugoku supply area - 23

Source of Power: Takiyama-gawa and Ota-kawa

Date of Construction: Construction was begun Jan 1937 and completed in 1939; in operation Mar 1940

Details: Particular capacities (in kw) - 8000 installed cap; 5900 reg; 2100 spec
Layout - A dam, built across the Ota-kawa below the discharge of the Uchinashi Hydro Plant, forms a reservoir from which the water is carried by aqueduct to the surge tank and then to the plant.
Eff head - 128.6 m; flow - 5.6 m^3/sec
Dam - Of concrete, inlaid with stones, 16.3 m high above base, 87 m long
Aqueduct - Gravity-type, 4971 m long, consisting of tunnel, partly covered ditch, and aqueduct bridge
Forebay - T-shaped, of concrete construction
Penstocks - 2
Plant, equipment -
Turbines - 2 @ unknown cap, Francis-type, vertical-shaft
Generators - 2 @ 5000 kva, 80% pf, 3-ph, 11,000 v, 600 rpm, 60 cyc, Meidensha-make

See: Figure No. II-6

Sources: DnN 1940; Ohm 4/37 p.400; DGS 3/37 p.305, 4/37 p.111; DnGZ 7/37, 9/37 p.(139), 1/40, 6/39, 1/41 p.(10) and inside front cover; KN 1939 p.166; HSG p.161